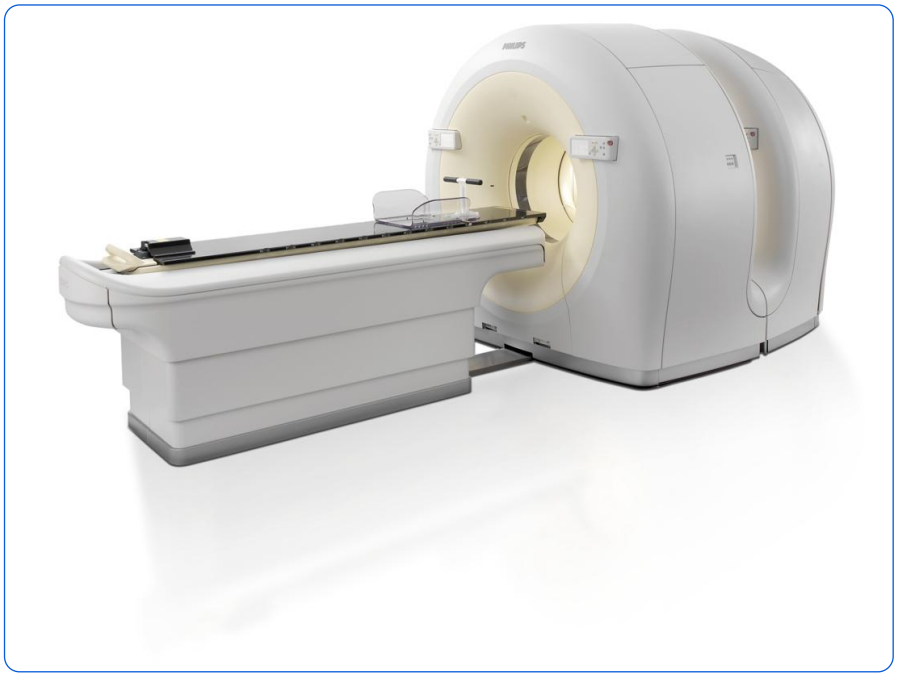
DICOM

Conformance Statement

GEMINI PET/CT Systems with v3.5 or 3.6



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1. DICOM CONFORMANCE STATEMENT OVERVIEW

This conformance statement refers to the GEMINI PET/CT Imaging Systems running software version 3.5 or 3.6 and includes the PET and CT acquisition systems (for acquired image data), the CT Host (for Modality Worklist and Modality Performed Procedure Step support) and the PET/CT Host (for Storage, Storage Commitment, Query/Retrieve and Media support). Hereafter these are referred to as the "GEMINI system".

The GEMINI system provides the following DICOM data exchange features:

- It receives images sent from remote systems (e.g. workstations or imaging modalities) and stores them in a database.
- It allows the operator to copy images from the database to remote databases and vice versa. For this purpose the operator is able to query remote databases.
- It allows the operator to print images (Grayscale and Color) stored in the database on a DICOM printer.
- It is able to read and write DICOM media CD, CD-RW disks.
- It is able to read and write DICOM media DVD+/-R, DVD+/-RW disks.
- It is able to request patient/study information from a HIS/RIS and return a completion status.

The following table presents an overview of all network services and the applicable SOP Classes as provided by the GEMINI system.

Table 1: Network Services

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	**UID**		
Other			
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes
Print Management			
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No
>Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
Query/Retrieve			
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Study Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Transfer			
Blending Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.4	Yes	Yes
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	Yes	Yes

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	**UID**		
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
Digital Intra-oral X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.3	Yes	Yes
Digital Intra-oral X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.3.1	Yes	Yes
Digital Mammography X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.2	Yes	Yes
Digital Mammography X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	Yes
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
Digital X-Ray Image Storage - For Proc. SOP	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes
General ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	Yes
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
Multi-frame Grayscale Byte SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.2	Yes	Yes
Multi-frame Grayscale Word SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.3	Yes	Yes
Multi-frame Single Bit Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.1	Yes	Yes
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	Yes
Nuclear Medicine Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.20	Yes	Yes
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128	Yes	Yes
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	Yes	Yes
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	Yes	Yes
RT Dose Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.2	Yes	Yes
RT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.1	Yes	Yes
RT Plan Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes
RT Structure Set Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	Yes
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes
Workflow Management			
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Yes	No
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No

Notes: Normally the system (SCU) requests only supported DICOM objects. All SOP Classes support the default Transfer Syntax ILE. All other transfer Syntaxes are configurable in LAN Config.

In the next table all the supported Network Services which can be blocked by the Blocking Filter are shown.

Table 2: Supported Network Services which can be blocked by the Blocking Filter

SOP Class	SOP Class UID	Description	SCU	SCP
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	RAW	Yes	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Encapsulated PDF	Yes	No
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	NM Original	Yes	No
		NM Derived	Yes	No
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	ECG Wave	Yes	No
Multi-frame Grayscale Word SC Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Grayscale Word MFSC	Yes	No
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	CT Original	Yes	No
		CT Derived	Yes	No
		Surview with Executed Lines (ES)	Yes	No
		Surview with Plan (PS)	Yes	No
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	MR Original	Yes	No
		MR Derived	Yes	No
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Key Image Selection	Yes	No
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	Color Softcopy PS	Yes	No
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	Blending Softcopy PS	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Secondary Capture	Yes	No
		Tissue	Yes	No
		Pulmo Wave	Yes	No
		Surview with Executed Lines (ES) as SC	Yes	No
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Spatial Registration	Yes	No
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	RT Dose	Yes	No
Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Grayscale Softcopy PS	Yes	No
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Single Bit MFSC	Yes	No
Multi-frame Grayscale Byte SC Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Grayscale Byte MFSC	Yes	No
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	True Color MFSC	Yes	No
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	PET Original	Yes	No
		PET Derived	Yes	No
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	Pseudo Color Softcopy PS	Yes	No

Notes:
- The possibility to block objects based on photometric interpretation = RGB is also provided (option "Color Images").
- The option to block all objects listed above is also provided.

Below, a table of Supported Media Storage Application Profiles (with roles) is provided.

After data is written to DVD, the DVD is finalized; the finalized DVD can now be read on any DVD reader. Currently the GEMINI system supports:
- FSC service for CD-R, CD-RW, DVD + R, DVD - R, DVD + RW, DVD - RW media
- FSR service for CD-R, CD-RW, DVD + R, DVD - R, DVD + RW, DVD - RW media

Table 3: Media Services

Media Storage Application Profile	File-set Creator (FSC)	File-set Updater (FSU)	File-set Reader (FSR)	Display Directory (DD)
Compact Disk-Recordable				
CT/MR Studies on CD-R	Yes	No	Yes	No
General Purpose CD-R Interchange	Yes	No	Yes	No
DVD				
General Purpose DVD Interchange with JPEG	Yes	No	Yes	No

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3. INTRODUCTION

3.1. Revision History

The revision history provides dates and differences of the different releases.

Table 4: Revision History

Document Version	Date of Issue	Description
A	Feb 2009	Initial version
B	May 2009	Preliminary version for beta
C	Mar 2010	Final validated version

3.2. Audience

This Conformance Statement is intended for:

- (Potential) customers
- System integrators of medical equipment
- Marketing staff interested in system functionality
- Software designers implementing DICOM interfaces

It is assumed that the reader is familiar with the DICOM standard.

3.3. Remarks

The DICOM Conformance Statement is contained in chapter 4 through 8 and follows the contents and structuring requirements of DICOM PS 3.2 (2008).
This DICOM Conformance Statement by itself does not guarantee successful interoperability of Philips equipment with non-Philips equipment. The user (or user's agent) should be aware of the following issues:

- **Interoperability**
  Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into an IT environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of Philips equipment with non-Philips equipment.
  It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.

- **Validation**
  Philips equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement. Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant Conformance Statements. If the

Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

- **New versions of the DICOM Standard**
  The DICOM Standard will evolve in the future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its products or to discontinue its delivery.
  The user should ensure that any non-Philips provider linking to Philips equipment also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

3.4. Definitions, Terms and Abbreviations

Table 5: Definitions, Terms and Abbreviations

Abbreviation/Term	Explanation
AE	Application Entity
ANSI	American National Standard Institute
AP	Application Profile
API	Application Programming Interface
ARTIM	Association Request Timer
BOT	Basic Offset Table
CD	Compact Disc
CD-R	CD-Recordable
CD-M	CD-Medical
CD-RW	CD-ReWritable
CR	Computed Radiography
CT	Computed Tomography
DCR	Dynamic Cardio Review
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DIMSE-Composite
DIMSE-N	DIMSE-Normalized
DVD-R, -RW	DVD, recordable or re-writeable, "minus" format.
DVD+R, +RW	DVD, recordable or re-writeable, "plus" format.
DX	Digital X-Ray
EBE	DICOM Explicit VR Big Endian
ELE	DICOM Explicit VR Little Endian
FSC	File-set Creator
FSE	Field Service Engineer
FSR	File-set Reader
FSU	File-set Updater
GUI	Graphic User Interface
HIS	Hospital Information System
HL7	Health Level Seven
ILE	DICOM Implicit VR Little Endian

Abbreviation/Term	Explanation
IOD	Information Object Definition
ISIS	Information System - Imaging System
LAN Config	GEMINI system configuration application
MOD	Magneto-Optical Disk
MPPS	Modality Performed Procedure Step
MR	Magnetic Resonance
MWL	Modality Worklist
NA	Not Applicable
NEMA	National Electrical Manufacturers Association
NM	Nuclear Medicine
PDF	Portable Document Format
PDU	Protocol Data Unit
PT	PET
RF	X-Ray Radiofluoroscopic
RIS	Radiology Information System
RT	Radiotherapy
RWA	Real-World Activity
SC	Secondary Capture
SCM	Study Component Management
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
US	Ultrasound
USMF	Ultrasound Multi-frame
VM	Value Multiplicity
VR	Value Representation
WLM	Worklist Management
XA	X-Ray Angiographic

3.5. References

DICOM Digital Imaging and Communications in Medicine, Parts 1 - 18 (NEMA PS 3.1- PS 3.18),
National Electrical Manufacturers Association (NEMA)
Publication Sales 1300 N. 17th Street, Suite 1752
Rosslyn, Virginia. 22209, United States of America
Internet: http://medical.nema.org/
Note that at any point in time the official standard consists of the most recent yearly edition of the base standard (currently 2008) plus all the supplements and correction items that have been approved as Final Text.

4. NETWORKING

4.1. Implementation model

The implementation model consists of three sections:

- The application data flow diagram, specifying the relationship between the Application Entities and the "external world" or Real-World Activities
- A functional description of each Application Entity, and
- The sequencing constraints among them.

4.1.1. Application Data Flow

The GEMINI system implements and provides DICOM services using the following Application Entities:

- Patient Catalog Service
- DICOM-Manager
- Print-Manager

The GEMINI system consists of three Application Entities. The following figure shows the Networking application data flow as a functional overview of the GEMINI system.

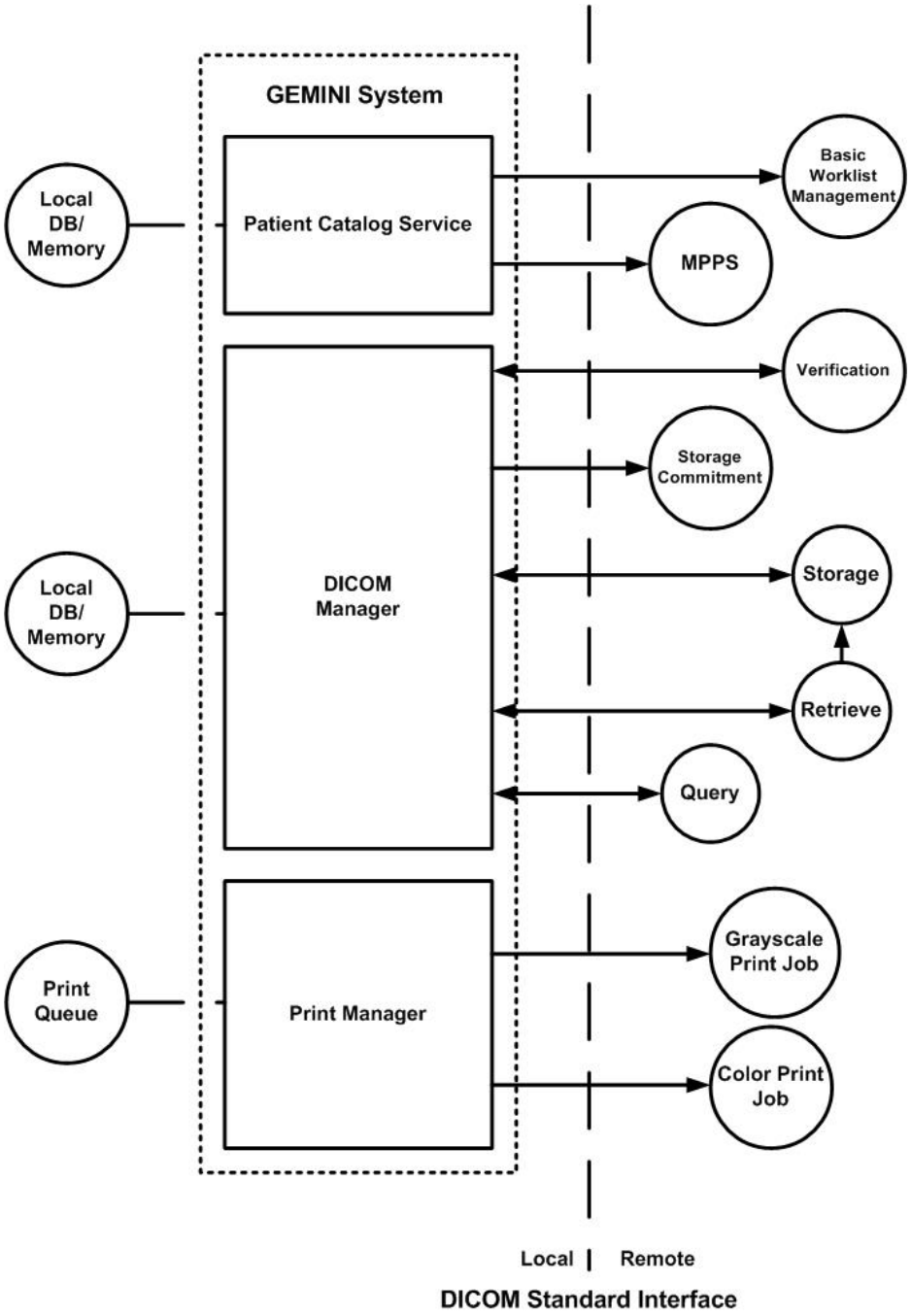

Figure 1: Network Application Data Flow Diagram

As depicted in the figure, the GEMINI system incorporates the following functionality.

- After operator RWA Request Modality Worklist, the GEMINI as SCU uses the Basic Worklist Management Service Class to request the worklist from a DICOM Radiology information system (RIS).
- After RWA Create and Set Modality Performed Procedure Step, the GEMINI as SCU uses the MPPS Service Class Class to report the modality performed procedure step.

- After RWA Request Verification, the GEMINI system as SCP provides standard Verification Service Class functionality to the requesting SCU.
- After RWA Import Images, the GEMINI system as SCP provides standard Storage Service Class functionality to the requesting SCU.
- After RWA Query Local Images/Retrieve Local Images, the GEMINI system as SCP provides standard Query/Retrieve Service Class functionality to the requesting SCU.
- After RWA Export Images (triggered by either the operator or RWA Retrieve Local Images), the GEMINI system as SCU uses the Remote SCP Storage Service Class functionality to store Local Images on a Remote Database.
- After operator RWA Find Remote Images, the GEMINI system as SCU uses the remote SCP Query/Retrieve Service Class functionality to query remote images.
- After operator RWA Move Remote Images, the GEMINI system as SCU uses the remote SCP Query/Retrieve Service Class functionality to retrieve remote images.
- After operator RWA Request Storage Commitment, the GEMINI system as SCU uses the remote SCP Storage Commitment Service Class functionality to commit remote images.
- After operator RWA Print Images, the GEMINI system as SCU uses the remote Print Management Service Class to print local images.
- After operator RWA Request Printer Status, the GEMINI system as SCU uses the remote Print Management Service Class to request the printer status.

4.1.2. Functional Definition of AEs

This section contains a functional definition for each individual local Application Entity.

4.1.2.1. Functional Definition of DICOM-Manager

The following figure shows the Network Application Data Flow Diagram of the DICOM-Manager.

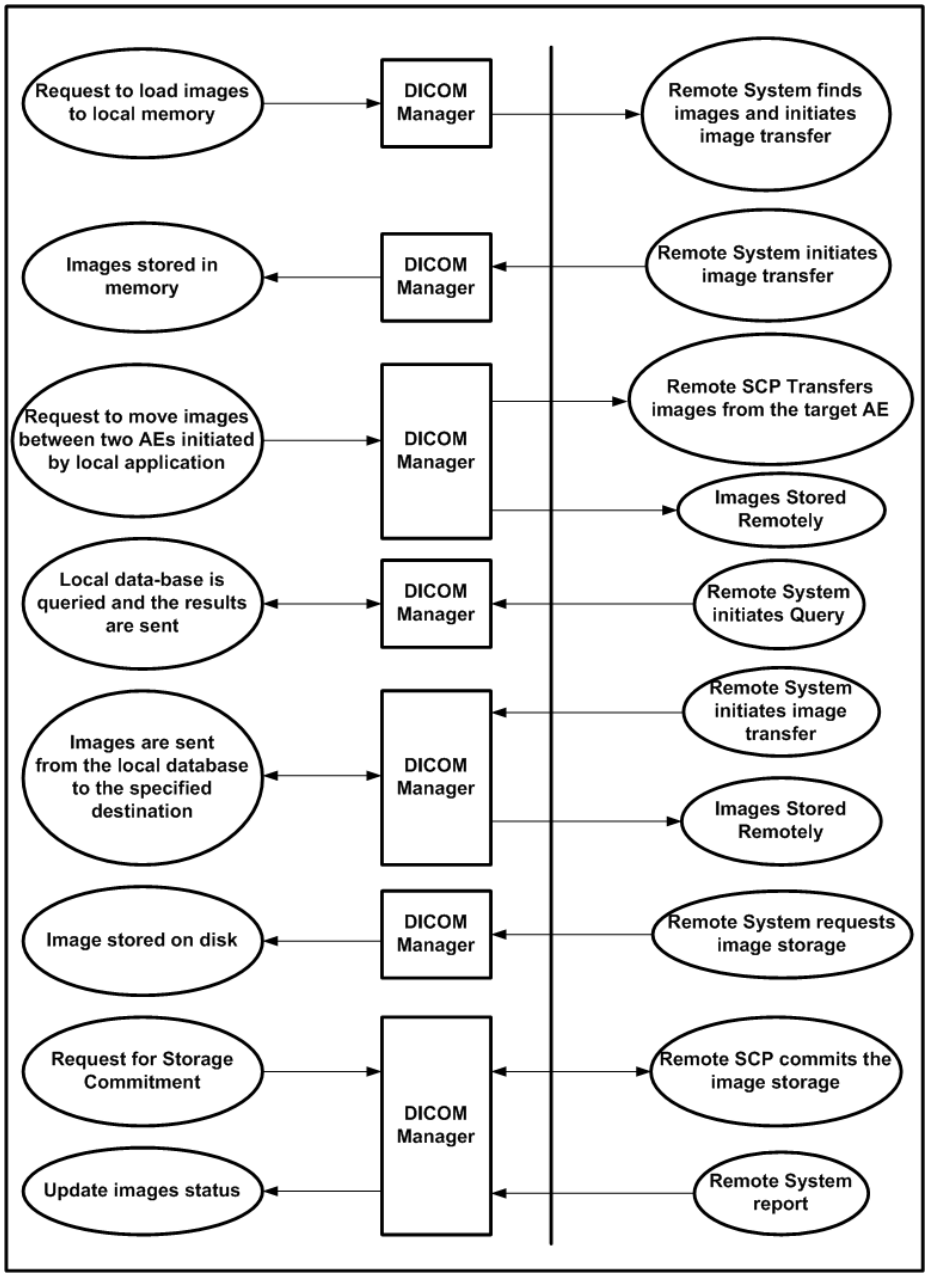

Figure 2: Network Application Data Flow Diagram of the DICOM-Manager

The DICOM-Manager includes the following service classes:

- The DICOM-Manager is responsible for loading images into memory.
- The DICOM-Manager gets requests from local image processing and display applications to load images to the memory. It performs these requests using the Query-Retrieve Service Class (C-MOVE only).
- The DICOM-Manager waits for another application to connect at the presentation address configured for its AE title. Memory-Server will accept associations with Presentation Contexts for SOP classes of the Storage and Verification Service Classes. It will receive images on these Presentation Contexts and load them into the system's memory.

Storage Service
- When performing a Storage Service Class (SCP), the DICOM-Manager will receive images and store them into the system's local database. The same AE may be used (with a configurable different AE title) to access the local MOD or different local hard disk folders.

Storage Commitment Service
- The DICOM-Manager is responsible to issue and support the storage commitment service as SCU.
- The DICOM-Manager establishes association with the specified AE title and sends storage commitment (N-ACTION) request using the push model. After that, it may accept storage commitment (N-EVENT-REPORT) requests on the same association or by establishing another association.

Query-Retrieve Service
- The DICOM-Manager waits for another application to connect at the presentation address configured for its AE title. The DICOM Manager will accept associations with Presentation Contexts for Service Object Pair (SOP) classes of the Storage, Query-Retrieve (C-MOVE and C-FIND only) and Verification Service Classes.
- When performing Query-Retrieve Service Class (C-FIND SCP), the DICOM-Manager will query its local database according to the request's parameters, and will send the results to the issuer.
- When performing Query-Retrieve Service Class (C-MOVE SCP), the DICOM-Manager will issue a C-STORE (SCU) to the target AE for every image found according to the request.

Import Service
- Imported data object received from an external system will be inserted into the local data base with all the original attributes (including private), except those that jeopardize database integrity or further processing by applications.

Export Service
- When an object is exported from the local database to an external device, the attributes will be preserved unless an Export Converter is applied.

4.1.2.2. Functional Definition of Patient Catalog Service

The Patient Catalog Server allows scanner software to communicate with a remote HIS/RIS system (as SCU) for the scheduled study information. The Patient Catalog Server gets requests from the Study program responsible for carrying out the whole scanning procedure, and reports the study start/finish conditions back to HIS/RIS.

The server translates these internal requests into DICOM Modality Worklist Management and MPPS Services Class commands.

The Patient Catalog Server can perform the following activities:

- Establish an association with a remote AE.
- Release an association with a remote AE.
- Issue a C-FIND request to get Modality Worklist Management scheduling information.
- Issue N-CREATE and N-SET requests to notify HIS/RIS by means of MPPS Service Class.

The following figure provides an illustration of Patient Catalog Server activities.

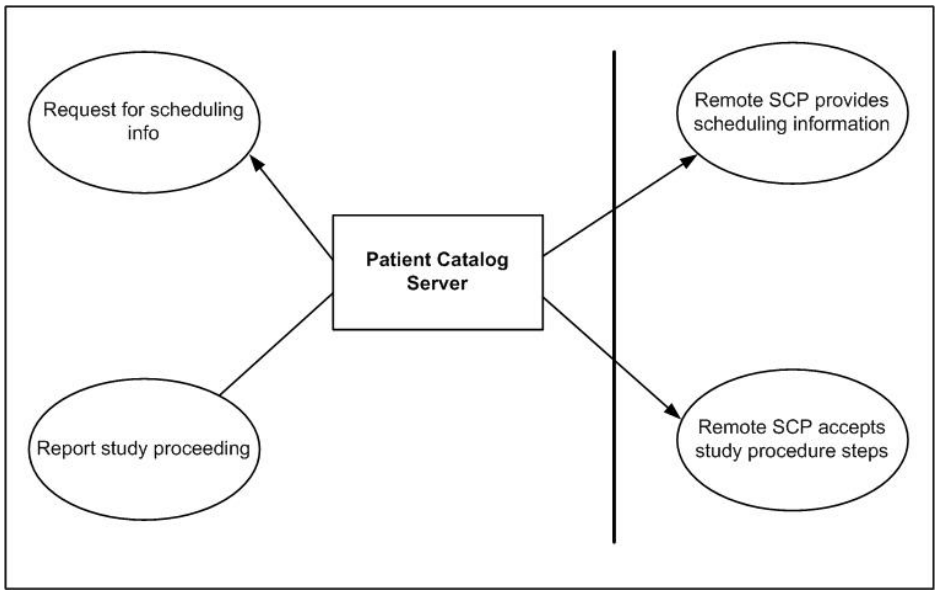

Figure 3: Illustration of Patient Catalog Service

4.1.2.3. Functional Definition of Print Manager

The Print-Manager is a Graphical User Interface (GUI) based application. It enables the user to print predefined images using the DICOM protocol. The user can specify as a printing destination one of several predefined printers. The user can also modify some of the printing parameters such as the film size and format. The following figure provides an illustration of Print-Manager activities.

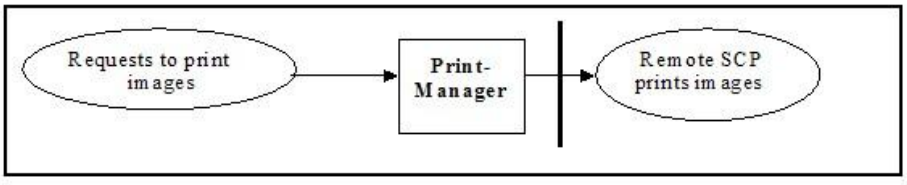

Figure 4: Network Application Data Flow Diagram of the Print Manager

4.1.3. Sequencing of Real World Activities

This section contains description of specific sequencing as well as potential constraints of Real-World Activities, including any applicable user interactions, as performed by the DICOM-Manager.

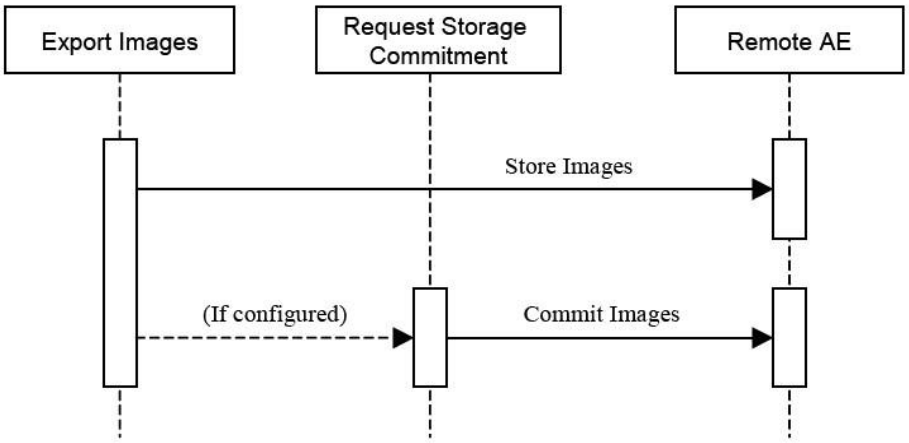

Figure 5: RWA Sequencing for Export Images

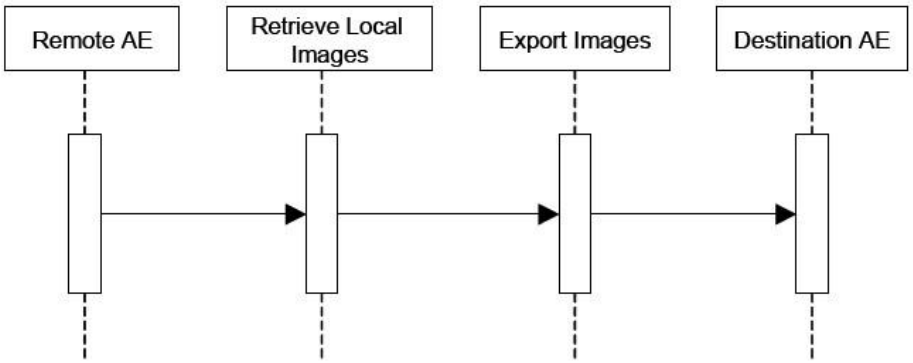

Figure 6: RWA Sequencing for Retrieve Local Images

4.2. AE Specifications

This section in the DICOM Conformance Statement is a set of Application Entity specifications. There are as many of these subsections as there are different AEs in the implementation.

4.2.1. DICOM-Manager

Detail of this specific Application Entity is specified in this section.

4.2.1.1. SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

Table 6: SOP Classes for DICOM-Manager

SOP Class Name	SOP Class UID	SCU	SCP
Blending Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.4	Yes	Yes
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	Yes	Yes
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
Digital Intra-oral X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.3	Yes	Yes
Digital Intra-oral X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.3.1	Yes	Yes
Digital Mammography X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.2	Yes	Yes
Digital Mammography X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	Yes
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
Digital X-Ray Image Storage - For Proc. SOP	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes
General ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	Yes
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
Multi-frame Grayscale Byte SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.2	Yes	Yes
Multi-frame Grayscale Word SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.3	Yes	Yes
Multi-frame Single Bit Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.1	Yes	Yes
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	Yes
Nuclear Medicine Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.20	Yes	Yes
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128	Yes	Yes
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	Yes	Yes
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	Yes	Yes
RT Dose Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.2	Yes	Yes
RT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.1	Yes	Yes
RT Plan Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes
RT Structure Set Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	Yes
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No

SOP Class Name	SOP Class UID	SCU	SCP
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Study Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes

Note: Any SOP specific behavior is documented later in the conformance statement in the applicable SOP specific conformance section.

The following SOP Classes are only supported for storage (not for viewing/processing):

Table 7: Network Services that are only supported for storage

SOP Class Name	SOP Class UID	SCU	SCP
RT Plan Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes
RT Structure Set Storage SOP Class	12.840.10008.5.1.4.1.1.481.3	Yes	Yes
RT Dose Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.2	Yes	Yes
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	Yes	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	Yes
Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	Yes	Yes
Psuedo-Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.3	Yes	Yes
Blending Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.4	Yes	Yes

The next IODs (as configured in LAN Config by FSE) can be blocked with the Blocking Filter in the GEMINI system.

Table 8: Supported Network Services for DICOM-Manager that can be blocked by the Blocking Filter

SOP Class Name	SOP Class UID	Description	SCU	SCP
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	RAW	Yes	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Encapsulated PDF	Yes	No
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	NM Original	Yes	No
		NM Derived	Yes	No
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	ECG Wave	Yes	No
Multi-frame Grayscale Word SC Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Grayscale Word MFSC	Yes	No
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	CT Original	Yes	No
		CT Derived	Yes	No
		Surview with Executed Lines (ES)	Yes	No
		Surview with Plan (PS)	Yes	No
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	MR Original	Yes	No
		MR Derived	Yes	No
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Key Image Selection	Yes	No
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	Color Softcopy PS	Yes	No

SOP Class Name	SOP Class UID	Description	SCU	SCP
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	Blending Softcopy PS	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Secondary Capture	Yes	No
		Tissue	Yes	No
		Pulmo Wave	Yes	No
		Surview with Executed Lines (ES) as SC	Yes	No
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Spatial Registration	Yes	No
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	RT Dose	Yes	No
Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Grayscale Softcopy PS	Yes	No
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.66.1	Single Bit MFSC	Yes	No
Multi-frame Grayscale Byte SC Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Grayscale Byte MFSC	Yes	No
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	True Color MFSC	Yes	No
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	PET Original	Yes	No
		PET Derived	Yes	No
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	Pseudo Color Softcopy PS	Yes	No

Notes:
- The possibility to block objects based on photometric interpretation = RGB is also provided (option "Color Images").
- The option to block all objects listed above is also provided.

4.2.1.2. Association Policies

Each AE specification contains a description of the general association establishment and acceptance policies of the AE.

Per configuration in LAN Config Tool, the system can accept associations from a range of IP addresses (not to check source IP or Calling AE Title). With incoming association requests the system allows acceptance of a range of defined IP addresses which is configurable in the LAN Config application. The system will not be IP or AE title sensitive.

4.2.1.2.1. General

The DICOM standard application context name is:

Table 9: DICOM Application Context

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2. Number of Associations

The number of simultaneous associations that an Application Entity may support as a Initiator or Acceptor is specified. As specified in the tables below, the number of simultaneous associations that will be accepted by DICOM-Manager is limited to 50.

Table 10: Number of associations as an Association Initiator for this AE

Description	Value
Maximum number of simultaneous associations	Unlimited

Table 11: Number of associations as an Association Acceptor for this AE

Description	Value
Maximum number of simultaneous associations	50

4.2.1.2.3. Asynchronous Nature

Table 12: Asynchronous nature as an Association Initiator for this AE

Description	Value
Maximum number of outstanding asynchronous transactions	1

4.2.1.2.4. Implementation Identifying Information

The value supplied for Implementation Class UID and version name are documented here:

Table 13: DICOM Implementation Class and Version for DICOM-Manager

Attribute	Value
Implementation Class UID	1.3.46.670589.33.1.1
Implementation Version Name	BRCONN_4.0

4.2.1.2.5. Communication Failure Handling

The behavior of the AE during communication failure is summarized in next table.

Table 14: Communication Failure Behavior

Exception	Behavior	Comment
ARTIM Timeout	The system stops the ARTIM timer and close the transport connection.	Configurable, minimum value=1.
Association Timeout	A release request is sent in order to close the association.	Configurable, minimum value=1.

4.2.1.3. Association Initiation Policy

The Application Entity will respond to a received Association rejection as shown in the next table.

Table 15: Association Rejection response

Result	Source	Reason/Diagnosis	Explanation
1 - rejected-permanent	1 - DICOM UL service-user	1 - no-reason-given	The connection is closed.
		2 - application-context-name-not supported	The connection is closed.
		3 - calling-AE-title-not-recognized	The connection is closed.
		7 - called-AE-title-not-recognized	The connection is closed.
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	The connection is closed.
		2 - protocol-version-not-supported	The connection is closed.
	3 - DICOM UL service-provider(Presentation related function)	1 - temporary-congestion	The connection is closed.
		2 - local-limit-exceeded	The connection is closed.
2 - rejected-transient	1 - DICOM UL service-user	1 - no-reason-given	The connection is closed.
		2 - application-context-name-not-supported	The connection is closed.
		3 - calling-AE-title-not-recognized	The connection is closed.
		7 - called-AE-title-not-recognized	The connection is closed.
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	The connection is closed.
		2 - protocol-version-not-supported	The connection is closed.
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary-congestion	The connection is closed.
		2 - local-limit-exceeded	The connection is closed.

The behavior of the AE on receiving an association abort is summarized in next table.

Table 16: Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	The connection is closed.
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	The connection is closed.
	1 - unrecognized-PDU	The connection is closed.
	2 - unexpected-PDU	The connection is closed.
	4 - unrecognized-PDU parameter	The connection is closed.
	5 - unexpected-PDU parameter	The connection is closed.
	6 - invalid-PDU-parameter value	The connection is closed.

The behavior of the AE for sending an association abort is summarized in next table.

Table 17: DICOM Association Abort Policies

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user	0 - reason-not-specified	When the system tries to disconnect before receiving an association accept but after sending association request; When receiving association accept with no presentation context item; When receiving association accept where all items in the presentation context item list are not accepted by remote system; When an association timeout (configurable per remote device) expired (timeout which determines how long to keep an idle association); When receiving a PDU whose size is bigger than the agreed max PDU size.
2 - DICOM UL service-provider	1- unrecognized-PDU	Whenever the system receives unexpected or unrecognized PDU (according to the DICOM UPPER LAYER PROTOCOL STATE TRANSITION TABLE in chapter 8 of the DICOM standard).

4.2.1.3.1. (Real-World) Activity – Verification as SCU

4.2.1.3.1.1. Description and Sequencing of Activities

DICOM-Manager initiates an association when the user points to one of the icons in the devices tool-bar, clicks the right mouse button and selects "Verify Connection" operation. A DICOM ping (C-ECHO) is available from the GEMINI application UI.

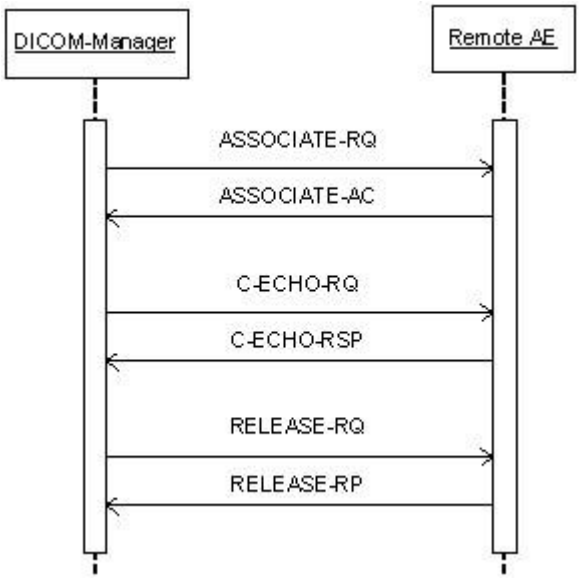

Figure 7: (Real World) Activity - Verification as SCU

4.2.1.3.1.2. Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association. The association will be closed immediately upon receiving the response.

The presentation contexts proposed by DICOM-Manager for (Real-World) Activity - Verification as SCU are defined in the following table.

Table 18: Proposed Presentation Contexts for (Real-World) Activity – Verification as SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Verification SOP Class	1.2.840.10008.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		CT-private-ELE	1.3.46.670589.33.1.4.1		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

Note: The default supported Transfer Syntax is ILE.

4.2.1.3.1.3. SOP Specific Conformance for Verification SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

DICOM-Manager provides standard conformance to the DICOM V3.0.

4.2.1.3.1.3.1. Dataset Specific Conformance for Verification C-ECHO SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 19: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Success	The SCU has successfully send C-ECHO.
Other than Success	<>0000	Problems with sending the C-ECHO	The SCU failed to send the C-ECHO; user is notified.

4.2.1.3.2. (Real-World) Activity – FIND As SCU

4.2.1.3.2.1. Description and Sequencing of Activities

DICOM-Manager initiates an association when the user clicks on one of the icons in the devices tool-bar. The DICOM-Manager searches (C-FIND) by Study Level following by Series level and, optionally (configurable), by Image Level.

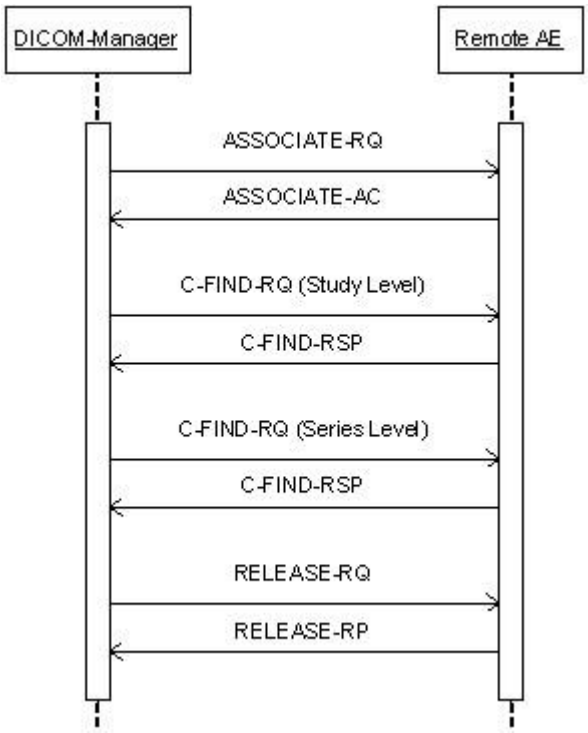

Figure 8: (Real World) Activity - Find as SCU

4.2.1.3.2.2. Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association. In this subsection, the presentation contexts proposed by Archive-Manager for (Real-World) Activity - Find as SCU are defined in the Table below.

Table 20: Proposed Presentation Contexts for (Real-World) Activity – FIND As SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		

4.2.1.3.2.3. SOP Specific Conformance for Study Root QR Information Model - FIND SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

The DICOM-Manager provides standard conformance to the DICOM V3.0.

4.2.1.3.2.3.1. Dataset Specific Conformance for Study Root QR Information Model - FIND SOP Class C-FIND-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 21: Supported Query Keys for Study Root Information Model

Study Root Information Model				
Attribute Name	**Tag**	**VR**	**Type Of Matching**	**Comment**
Query/Retrieve Level	0008,0052	CS	Universal	
Q/R Image level				
Columns	0028,0011	US	Universal	
Contrast/Bolus Agent	0018,0010	LO	Universal	
Frame of Reference UID	0020,0052	UI	Single Value	
Image Orientation (Patient)	0020,0037	DS	Universal	
Image Type	0008,0008	CS	Single Value	
Instance Creation Date	0008,0012	DA	Single Value	
Instance Creation Time	0008,0013	TM	Single Value	
Instance Number	0020,0013	IS	Single Value	
KVP	0018,0060	DS	Universal	
Patient Orientation	0020,0020	CS	Universal	
Photometric Interpretation	0028,0004	CS	Single Value	
Pixel Spacing	0028,0030	DS	Universal	
Rows	0028,0010	US	Universal	
Samples per Pixel	0028,0002	US	Single Value	
Slice Location	0020,1041	DS	Universal	
Slice Thickness	0018,0050	DS	Universal	
SOP Class UID	0008,0016	UI	Single Value	
SOP Instance UID	0008,0018	UI	Universal	
Q/R Series level				
Body Part Examined	0018,0015	CS	Universal	
Manufacturer	0008,0070	LO	Universal	
Modality	0008,0060	CS	Universal	
Number of Series Related Instances	0020,1209	IS	Universal	
Performed Procedure Step Start Date	0040,0244	DA	Universal	
Performed Procedure Step Start Time	0040,0245	TM	Single Value	
Protocol Name	0018,1030	LO	Single Value	
Series Date	0008,0021	DA	Single Value, Universal	
Series Instance UID	0020,000E	UI	Universal	
Series Number	0020,0011	IS	Universal	
Series Time	0008,0031	TM	Universal	
Request Attributes Sequence	0040,0275	SQ	Universal	
>Requested Procedure ID	0040,1001	SH	Universal	
>Scheduled Procedure Step ID	0040,0009	SH	Universal	

Q/R Study level				
Accession Number	0008,0050	SH	Single Value	
Modalities in Study	0008,0061	CS	Single Value	
Number of Study Related Instances	0020,1208	IS	Universal	
Number of Study Related Series	0020,1206	IS	Universal	
Patient ID	0010,0020	LO	Single Value	
Patient's Birth Date	0010,0030	DA	Single Value	
Patient's Birth Time	0010,0032	TM	Single Value, Universal, WildCard	
Patient's Name	0010,0010	PN	Single Value	
Performed Procedure Step Description	0040,0254	LO	Single Value, Universal	
Referring Physician's Name	0008,0090	PN	Range, Single Value, Universal	
Study Date	0008,0020	DA	Range, Single Value, Universal	
Study Description	0008,1030	LO	Universal	
Study ID	0020,0010	SH	Single Value, Universal, WildCard	
Study Instance UID	0020,000D	UI	Single Value, Universal, WildCard	
Study Time	0008,0030	TM	Universal	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 22: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Success	Matching is successful.
Failure	A700	Refused - Out of resources	
	A900	Failed - Unknown reason	
	C000	Failed - Unknown reason	

4.2.1.3.3. (Real-World) Activity – MOVE As SCU

4.2.1.3.3.1. Description and Sequencing of Activities

The RWA Move Remote Images involves the retrieval of images on a remote system by moving matching images from the remote database to another database.

The operator is able to copy the selected images in a patient folder from a remote database to another, local or remote, database by means of the copy tool in the DICOM-Manager data handling facility. The DICOM-Manager initiates for each copy request an association to the selected peer entity (Remote AE) and uses it to send the Retrieve (C-MOVE) request (and receive the associated responses). An examination may contain both images and presentation states. The association is released after the final Retrieve (C-MOVE) response for the related request has been received (no more pending).

DICOM-Manager initiates an association when an image processing application asks for image loading from a specified source device using a proprietary IPC protocol.

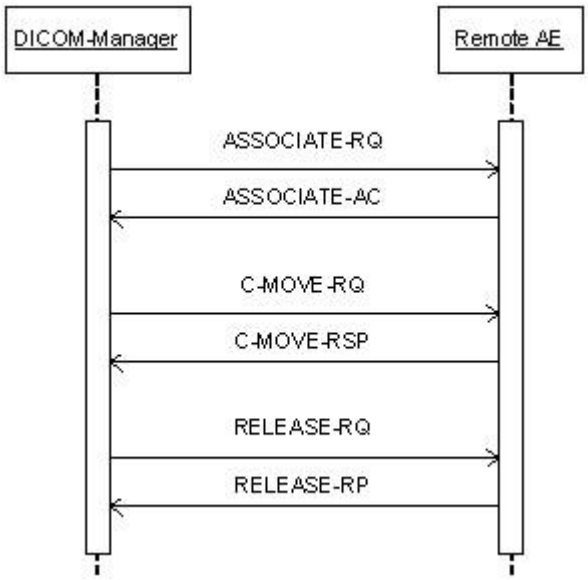

Figure 9: (Real World) Activity - Move as SCU

4.2.1.3.3.2. Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association.

In this subsection, the presentation contexts proposed by DICOM-Manager for (Real-World) Activity - Move as SCU are defined in the following table.

Table 23: Proposed Presentation Contexts for (Real-World) Activity – MOVE As SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Study Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	CT-private-ELE	1.3.46.670589.33.1.4.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.3.3.3. SOP Specific Conformance for Study Root QR Information Model - MOVE SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

DICOM-Manager provides standard conformance to the DICOM V3.0 Query/Retrieve Service Class as an SCU for the SOP Class Study Root Query/Retrieve Information Model - Move.

4.2.1.3.3.3.1. Dataset Specific Conformance for Study Root QR Information Model - MOVE SOP Class C-MOVE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 24: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Success	Storage successful.
Failure	A701	Refused - Out of Resources	Message by transfer result - Refused Unknown reason.
	A702	Refused - Out of Resources	Message by transfer result - Refused Store Failed.
	A801	Refused - Move Destination Unknown	Message by transfer result - Refused Unknown target.
	A900	Error - Identifier Does Not Match SOP Class	Message by transfer result - Failed Unknown reason.
	C000	Error - Unable to Process	Message by transfer result - Failed Store Failed.
Warning	B000	Sub-operations complete - One or more failures	Whenever one of the store operations failed.
Cancel	FE00	Cancel	Message by transfer result - Refused Connection closed on timeout.

4.2.1.3.4. (Real-World) Activity – Image Export

4.2.1.3.4.1. Description and Sequencing of Activities

The associated Real-World Activity is a request for retrieval of images from the disk/memory and storage of the images to a remote system using a C-STORE command.

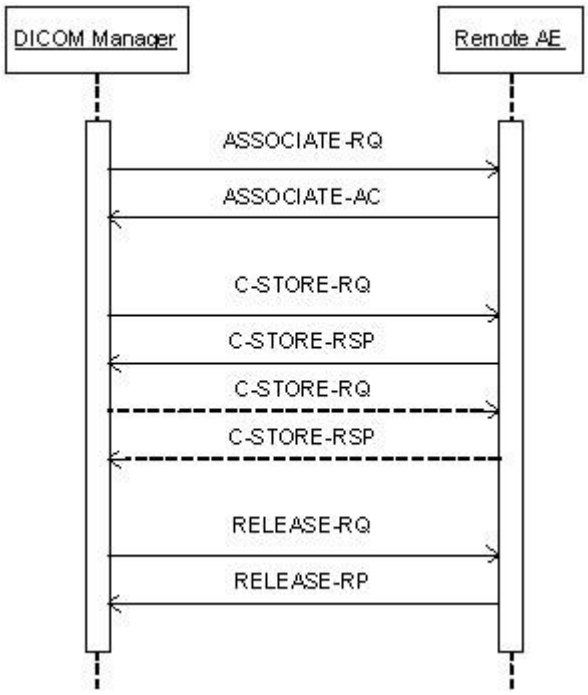

Figure 10: (Real World) Activity - Image Export

4.2.1.3.4.2. Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association.

If, per configuration all DICOM objects are requested, then there is no correction on import for those objects and can be saved "as is" (except ILE/ELE conversion or compression).

The system configuration (by FSE in LAN Config) allows disabling individually each of the supported syntaxes per remote device when establishing and accepting associations. At least one of the syntaxes will be enabled.

When establishing association to a remote device, all the enabled (for that device) syntaxes will be proposed. If more than one Transfer Syntax is accepted by the SCP, the order of selecting the syntax to use is: Private-ELE, ELE and ILE.

When accepting association from the remote device, only the enabled (for that device) transfer syntaxes will be accepted. If more than one transfer syntax fits this, the order of selecting the syntax to use is: Private-ELE, ELE and ILE.

The default enabled configuration setting in LAN Config, for transfer syntaxes are ILE and ELE. By default the Private ELE is disabled.

During data export the GEMINI system preserves the Date and Time format of the original data.

The presentation contexts proposed by the DICOM-Manager for (Real-World) Activity (C-STORE SCU) are defined in the following table.

Explicit VR Transfer Syntaxes for a specific AE target may be restricted using the configuration utility.

Table 25: Proposed Presentation Contexts for (Real-World) Activity – Image Export

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Blending Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		CT-private-ELE	1.3.46.670589.33.1.4.1		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Digital Intra-oral X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Digital Intra-oral X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.3.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Digital Mammography X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Digital Mammography X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Digital X-Ray Image Storage - For Proc. SOP	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
General ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	CT-private-ELE	1.3.46.670589.33.1.4.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Multi-frame Grayscale Byte SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Multi-frame Grayscale Word SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Multi-frame Single Bit Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Nuclear Medicine Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
RT Dose Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
RT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
RT Plan Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
SOP Class		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	CT-private-ELE	1.3.46.670589.33.1.4.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		

Note: The default supported Transfer Syntax is ILE. All Transfer Syntaxes are configurable in LAN Config, in the order Private-ELE, ELE, and ILE.

DICOM-Manager prefers an explicit Transfer Syntax encoding. If offered a choice of Transfer Syntaxs in a Presentation Context, it will apply the following priorities to the choice of Transfer Syntax which can be configured in LAN Config Tool:

Table 26: Transfer Syntax Priorities

Transfer Syntax	UID	Comment
1. Private DICOM Explicit VR Little Endian (CT-private-ELE)	1.3.46.670589.33.1.4.1	LAN Config.
2. DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	LAN Config.
3. DICOM Implicit VR Little Endian	1.2.840.10008.1.2	LAN Config, default.

The system configuration of the GEMINI system (by FSE in LAN Config) allows the FSE to disable individually each of the supported Transfer Syntaxes per remote device when establishing and accepting associations. At least one of the Transfer Syntaxes will be enabled.

During association negotiation, the system offers all the transfer syntaxes in one presentation context. The SCP will determine which transfer syntax is going to select, not the SCU.

4.2.1.3.4.3. SOP Specific Conformance for Storage SOP Classes

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

The DICOM-Manager AE provides standard conformance to the DICOM V3.0 Storage Service Class as an SCU for SOP Classes mentioned in the previous section.

Multiple C-STORE operations can be performed over a single association. Upon

receiving a C-STORE Response containing a successful status, this implementation will perform the next C-STORE operation (if this operation is the result of the Series Level Move request). The association will be kept open if possible.

Any unsuccessful status (error or warning), returned in the C-STORE Response, results in termination of sending further C-STORE requests (if any in the queue) and reporting of the error to the system log file.

There are two timeouts for the association. One timeout, "Association Timeout" is used to close an idle association. For C-STORE the default is 120 seconds and can be configured per remote DICOM node. The other timeout is "Service Timeout" which detects that no data is transmitted over the association and closes it. The default "Service Timeout" for C-STORE is 5 minutes.

For detailed information about the created SOP Classes, refer to chapters 8 to 12.

4.2.1.3.4.3.1. Dataset Specific Conformance for C-STORE-RQ

Detail regarding the Dataset Specific response behavior will be reported in this section. This includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 27: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Success	Storage successful.
Failure	0122	Refused - SOP Class not supported	Message by transfer result - Unknown reason.
	A700	Refused - Out of Resources	Message by transfer result - Out of Resources.
	A900	Error - Data Set does not match SOP	Message by transfer result - Unknown reason.
	C000	Error - Cannot understand	Message by transfer result - Store failed.
Warning	B000	Coercion of Data Elements	Warning status is treated as success.
	B006	Elements Discarded	Warning status is treated as success.
	B007	Data Set does not match	Warning status is treated as success.

4.2.1.3.5. (Real-World) Activity – Storage Commitment Push Model AS SCU

4.2.1.3.5.1. Description and Sequencing of Activities

DICOM-Manager will attempt to initiate a new association when requested to commit the images that were stored on a remote device, which supports the storage Commitment Service.

The associated real world activity for the N-ACTION is a storage commitment request to the remote storage device.

The associated real world activity for the N-EVENT-REPORT operation is the completion of the storage commitment by the remote device. DICOM-Manager will issue a failure status if it is unable to properly handle the storage commitment report event.

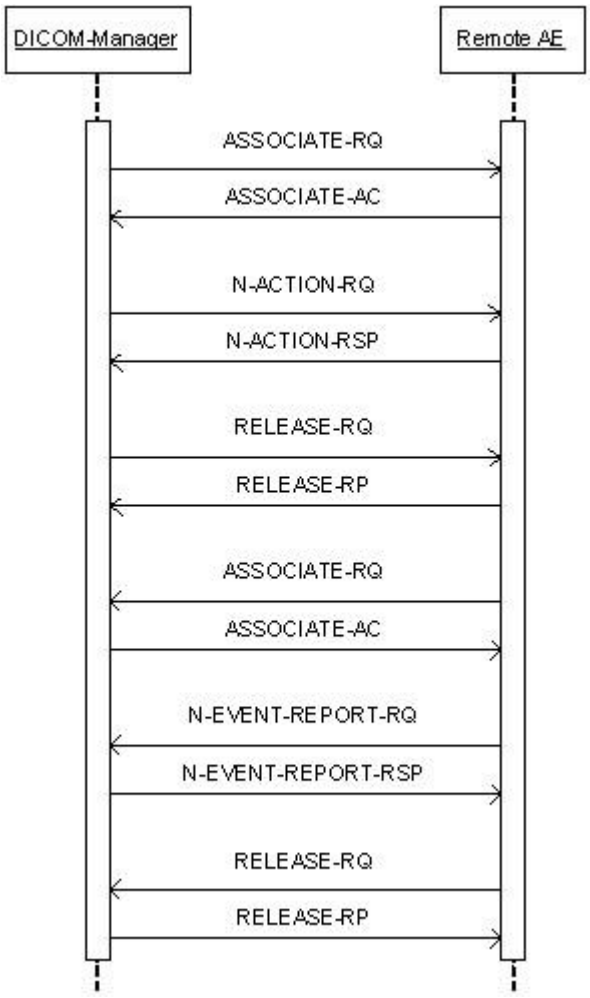

Figure 11: (Real World) Activity - Storage Commitment as SCU

4.2.1.3.5.2. Proposed Presentation Contexts

Each time an association is initiated, the association initiator proposes a number of presentation contexts to be used on that association.

The presentation contexts proposed by DICOM-Manager for (Real-World) Activity - Storage Commitment as SCU are defined in the following table.

Table 28: Proposed Presentation Contexts for (Real-World) Activity – Storage Commitment Push Model AS SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		

4.2.1.3.5.3. SOP Specific Conformance for Storage Commitment Push Model SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

DICOM-Manager provides standard conformance to the DICOM V3.0 Storage Commitment Service Class using Push Model as an SCU.

Multiple N-ACTION requests can be performed over a single association. Multiple N-EVENT-REPORT requests can be accepted over a single association. After all N-ACTION requests that are waiting in the stack are issued, association will be closed with the timeout of 60 seconds.

A remote system reports about storage commitment completion using N-EVENT-REPORT command. The system can also accept the N-EVENT-REPORT commands over a separate association initiated by the remote system, using reverse role negotiation.

Storage Commitment for individual images are grouped into large "chunks" and issued as a single Storage Commitment request.

4.2.1.3.5.3.1. Dataset Specific Conformance for Storage Commitment Push Model SOP Class N-EVENT-REPORT-SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 29: Storage Commitment N-EVENT-REPORT Behavior

Event Type Name	Event Type	Behavior
Storage Commitment Request Successful	1	Successfully committed instances are marked as "transferred".
Storage Commitment Request Complete - Failures Exist	2	See below.

Table 30: Storage Commitment N-EVENT-REPORT Failure Handling Behavior

Service Status	Error Code	Further Meaning	Description
Success	0000	Success	The storage commitment result has been successfully received.
Failure	0211	Unrecognized Operation	The transaction UID in the N-EVENT-REPORT request is not recognized.
	0213	Resource Limitation	The Transaction UID in the N-EVENT-REPORT request has expired.
	0113	No Such Event Type	An invalid Event Type ID was supplied in the N-EVENT-REPORT.
	0110	Processing Failure	An internal error occurred during processing.
	0115	Invalid Argument Value	One of more SOP Instance UID's with the Referenced SOP Sequence (0008.1199) or Failed SOP Sequence (0008,1198) was not included in the Storage Commitment Request associated with this Transaction UID.

4.2.1.3.5.3.2. Dataset Specific Conformance for Storage Commitment Push Model SOP Class N-ACTION-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 31: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Success	The request for storage commitment is considered successfully stored.
Other than Success	<>0000	Problems with sending the N-ACTION	The association is aborted and the request for storage commitment is marked as failed.

4.2.1.4. Association Acceptance Policy

The Application Entity may reject Association attempts as shown in the table below.

Table 32: DICOM Association Rejection Policies

Result	Source	Reason/Diagnosis	Explanation
1 - rejected permanent	1 - DICOM UL service-user	2 - application-context-name-not-supported	When receiving association request and the application context name is not supported.
		3 - calling-AE-title-not-recognized	When receiving association request and the calling AE title is not supported.
		7 - called-AE-title-not-recognized	When receiving association request and the called AE title is not supported.
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	When receiving association request and all of the items in the presentation context item list are not supported by the system.
		2 - protocol-version-not-supported	When receiving an association request and the protocol version received is not supported.

The behavior of the AE on DICOM receiving Association Abort Handling is summarized in table below:

Table 33: DICOM receiving Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	The connection is closed.
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	The connection is closed.
	1 - unrecognized-PDU	The connection is closed.
	2 - unexpected-PDU	The connection is closed.
	4 - unrecognized-PDU parameter	The connection is closed.
	5 - unexpected-PDU parameter	The connection is closed.
	6 - invalid-PDU-parameter value	The connection is closed.

The behavior of the AE for sending an association abort is summarized in next table.

Table 34: Association Abort Policies

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	When an association timeout (configurable per remote device) expired (timeout which determines how long to keep an idle association).When receiving a PDU whose size is bigger then the agreed max PDU size.
2 - DICOM UL service-provider (initiated abort)	1 - unrecognized-PDU	Whenever the system receives unexpected or unrecognized PDU (according to the DICOM UPPER LAYER PROTOCOL STATE TRANSITION TABLE in chapter 8 of the DICOM standard).

4.2.1.4.1. (Real-World) Activity – Verification as SCP

4.2.1.4.1.1. Description and Sequencing of Activities

A remote system requests verification from DICOM-Manager using the C-ECHO command.

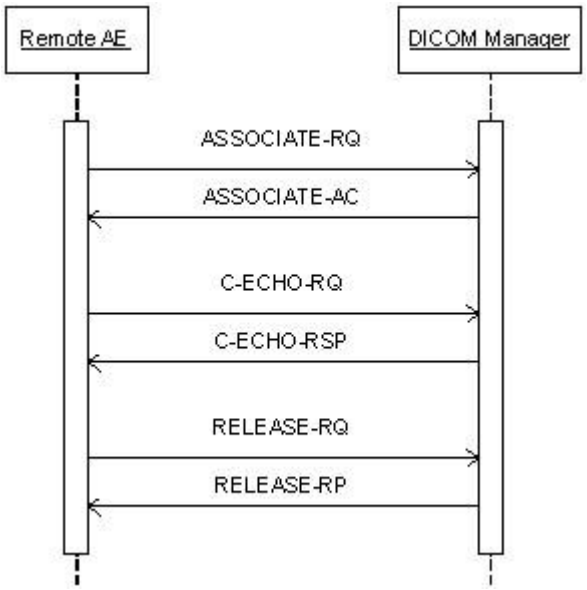

Figure 12: (Real World) Activity - Verification as SCP

4.2.1.4.1.2. Accepted Presentation Contexts

The presentation contexts are defined in next table.

Table 35: Acceptable Presentation Contexts for (Real-World) Activity – Verification as SCP

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Verification SOP Class	1.2.840.10008.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		

Note: The default Transfer Syntax is ILE. All other Transfer Syntaxes are configurable.

4.2.1.4.1.3. SOP Specific Conformance for Verification SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

DICOM-Manager (C-ECHO SCP) provides standard conformance to the DICOM V3.0 verification SOP Class.

4.2.1.4.1.3.1. Dataset Specific Conformance for Verification C-ECHO SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 36: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Success	C-ECHO command was successful received.
Other than Success	<>0000	Problems with receiving the C-ECHO command	Problems with receiving the C-ECHO command.

4.2.1.4.2. (Real-World) Activity – FIND As SCP

4.2.1.4.2.1. Description and Sequencing of Activities

The Real World activity associated with the C-FIND-SCP is querying of the local disk based on C-FIND-RQ from the remote DICOM node. DICOM-Manager will issue a failure status if it is unable to process the query request.

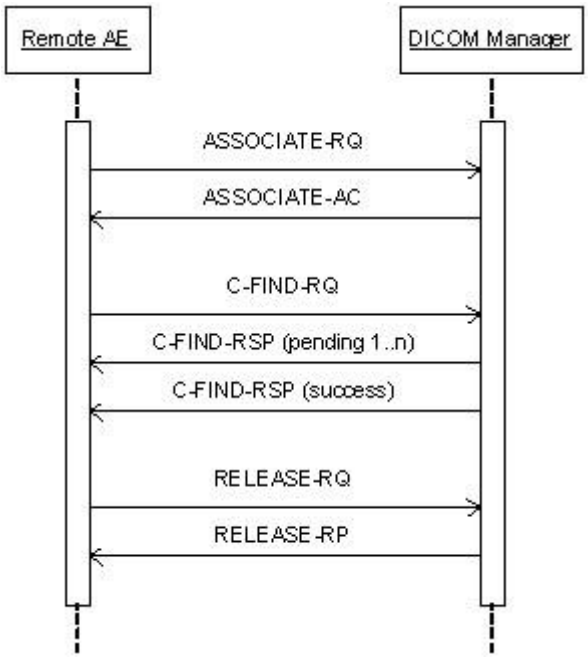

Figure 13: (Real World) Activity - Find as SCP

4.2.1.4.2.2. Accepted Presentation Contexts

The presentation contexts are defined in next table.

Table 37: Acceptable Presentation Contexts for (Real-World) Activity – FIND As SCP

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		

4.2.1.4.2.3. SOP Specific Conformance for Study Root QR Information Model - FIND SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

DICOM-Manager provides standard conformance to the DICOM V3.0 Query/Retrieve Service Class as an SCP for the following SOP Class: Study Root Query/Retrieve Information Model - FIND, UID=1.2.840.10008.5.1.4.1.2.2.1.

4.2.1.4.2.3.1. Dataset Specific Conformance for Study Root QR Information Model - FIND SOP Class C-FIND-SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.

The GEMINI system does not support Relational Search, a query that may contain any combination of keys at any level in the hierarchy. Only Hierarchival Search is supported.

All Required (R) and Unique (U) Study, Series and Image level keys for the Study Root Query/Retrieve Information Model are supported.

Unsupported fields will not be returned in the C-FIND response.

Table 38: Requested Query Keys for Study Root Information Model

Study Root Information Model				
Attribute Name	**Tag**	**VR**	**Type Of Matching**	**Comment**
Query/Retrieve Level	0008,0052	CS	Universal	
Q/R Image level				
Columns	0028,0011	US	Universal	
Contrast/Bolus Agent	0018,0010	LO	Universal	
Frame of Reference UID	0020,0052	UI	Single Value	
Image Orientation (Patient)	0020,0037	DS	Universal	
Image Type	0008,0008	CS	Single Value	
Instance Creation Date	0008,0012	DA	Single Value	
Instance Creation Time	0008,0013	TM	Single Value	
Instance Number	0020,0013	IS	Single Value	
KVP	0018,0060	DS	Universal	
Patient Orientation	0020,0020	CS	Universal	
Photometric Interpretation	0028,0004	CS	Single Value	
Pixel Spacing	0028,0030	DS	Universal	
Rows	0028,0010	US	Universal	
Samples per Pixel	0028,0002	US	Single Value	
Slice Location	0020,1041	DS	Universal	
Slice Thickness	0018,0050	DS	Universal	
SOP Class UID	0008,0016	UI	Single Value	
SOP Instance UID	0008,0018	UI	Universal	
Q/R Series level				
Body Part Examined	0018,0015	CS	Universal	
Manufacturer	0008,0070	LO	Universal	
Modality	0008,0060	CS	Universal	
Number of Series Related Instances	0020,1209	IS	Universal	
Performed Procedure Step Start Date	0040,0244	DA	Universal	
Performed Procedure Step Start Time	0040,0245	TM	Single Value	
Protocol Name	0018,1030	LO	Single Value	
Series Date	0008,0021	DA	Single Value, Universal	
Series Instance UID	0020,000E	UI	Universal	
Series Number	0020,0011	IS	Universal	
Series Time	0008,0031	TM	Universal	
Request Attributes Sequence	0040,0275	SQ	Universal	
>Requested Procedure ID	0040,1001	SH	Universal	
>Scheduled Procedure Step ID	0040,0009	SH	Universal	

Q/R Study level				
Accession Number	0008,0050	SH	Single Value	
Modalities in Study	0008,0061	CS	Single Value	
Number of Study Related Instances	0020,1208	IS	Universal	
Number of Study Related Series	0020,1206	IS	Universal	
Patient ID	0010,0020	LO	Single Value	
Patient's Birth Date	0010,0030	DA	Single Value	
Patient's Birth Time	0010,0032	TM	Single Value, Universal, WildCard	
Patient's Name	0010,0010	PN	Single Value	
Performed Procedure Step Description	0040,0254	LO	Single Value, Universal	
Referring Physician's Name	0008,0090	PN	Range, Single Value, Universal	
Study Date	0008,0020	DA	Range, Single Value, Universal	
Study Description	0008,1030	LO	Universal	
Study ID	0020,0010	SH	Single Value, Universal, WildCard	
Study Instance UID	0020,000D	UI	Single Value, Universal, WildCard	
Study Time	0008,0030	TM	Universal	

C-FIND-CANCEL is supported. However, some C-FIND responses may be forwarded before the C-FIND-CANCEL takes effect.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 39: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching complete	Matching successful.
Failure	C000	General failure status	Whenever the find operation failed.

4.2.1.4.3. (Real-World) Activity – MOVE As SCP

4.2.1.4.3.1. Description and Sequencing of Activities

The Real World activity associated with the C-MOVE command is retrieval of images from the disk and storage of the images to a remote system using a C-STORE command. DICOM-Manager will issue a failure status if it is unable to process the transfer request.

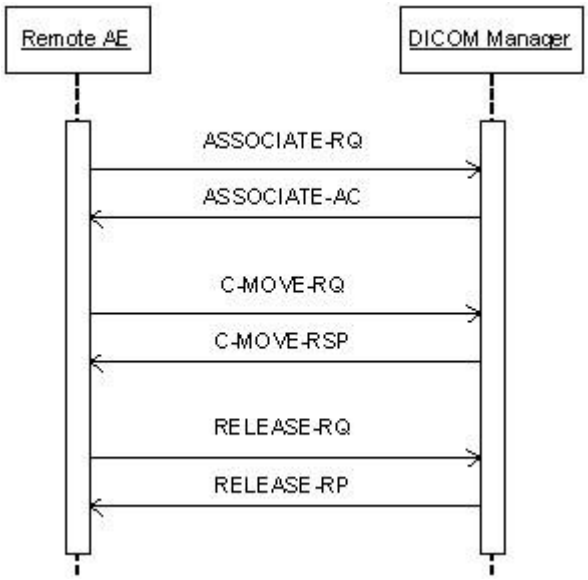

Figure 14: (Real World) Activity - Move as SCP

4.2.1.4.3.2. Accepted Presentation Contexts

The presentation contexts are defined in next table.

Table 40: Acceptable Presentation Contexts for (Real-World) Activity – MOVE As SCP

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Study Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		

4.2.1.4.3.3. SOP Specific Conformance for Study Root QR Information Model - MOVE SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

DICOM-Manager provides standard conformance to the DICOM V3.0 Query/Retrieve Service Class as an SCP for the following SOP Class: Study Root Query/Retrieve Information Model - MOVE, UID=1.2.840.10008.5.1.4.1.2.2.2. Prioritization of C-MOVE requests is not supported.

4.2.1.4.3.3.1. Dataset Specific Conformance for Study Root QR Information Model - MOVE SOP Class C-MOVE-SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.

DICOM-Manager does not support relational C-MOVE requests. All images requested in the C-MOVE will be sent over a single association.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

All details regarding the specific conformance, including response behavior of all status codes, both from an application level and communication errors are provided in the following table.

Table 41: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching complete	Whenever the move operation succeeded.
Failure	A801	Refused - Move Destination Unknown	Whenever the move destination is unknown to the system.
	C000	Error - Unable to Process	Whenever the move operation failed.
Warning	B000	Sub-operations Complete - One or more Failures	Whenever one of the store operations failed
Pending	FF00	Pending	For every store response received.
Cancel	FE00	Cancel	When receiving a cancel move request.

4.2.1.4.4. (Real-World) Activity – Image Import

4.2.1.4.4.1. Description and Sequencing of Activities

The real world activity associated with the C-STORE operation is the storage of the image in the memory of the system upon which DICOM-Manager is running in order to make it available for immediate processing by applications. DICOM-Manager will issue a failure status if it is unable to store the image in the memory.

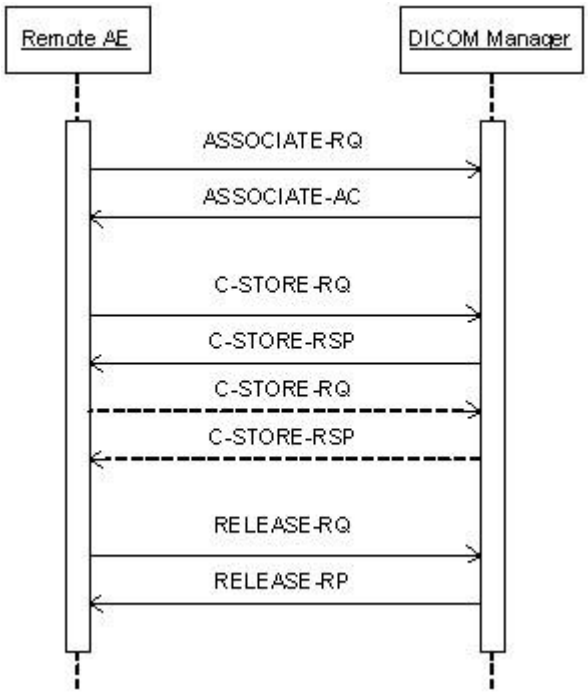

Figure 15: (Real World) Activity - Image Import

4.2.1.4.4.2. Accepted Presentation Contexts

The presentation contexts are defined in next table.

Table 42: Acceptable Presentation Contexts for (Real-World) Activity – Image Import

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Blending Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Digital Intra-oral X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Digital Intra-oral X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.3.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Digital Mammography X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Digital Mammography X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Digital X-Ray Image Storage - For Proc. SOP	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
General ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	CT-private-ELE	1.3.46.670589.33.1.4.1	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Multi-frame Grayscale Byte SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Multi-frame Grayscale Word SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Multi-frame Single Bit Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Multi-frame True Color Secondary Capture	1.2.840.10008.5.1.4.1.1.7.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Image Storage		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Nuclear Medicine Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
RT Dose Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
RT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
RT Plan Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
RT Structure Set Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	CT-private-ELE	1.3.46.670589.33.1.4.1	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		CT-private-ELE	1.3.46.670589.33.1.4.1		

Note: The default supported Transfer Syntax is ILE. All Transfer Syntaxes are configurable in LAN Config, in the order Private-ELE, ELE, and ILE.

4.2.1.4.4.3. SOP Specific Conformance for Storage SOP Classes

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

DICOM-Manager provides standard conformance to the DICOM V3.0 Storage Service Class as a SCP. DICOM-Manager conforms to the SOPs of the Storage Service Class at Level 2 (Full). In case of a successful C-STORE, the stored image may be accessed by the processing applications.

4.2.1.4.4.3.1. Dataset Specific Conformance for C-STORE-RSP

Detail regarding the Dataset Specific response behavior will be reported in this section. This includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 43: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successfully stored	Whenever the store operation succeeded.
Failure	C000	Failed	Whenever the store operation failed.

4.2.2. Patient Catalog Service

Detail of this specific Application Entity is specified in this section.

4.2.2.1. SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

Table 44: SOP Classes for Patient Catalog Service

SOP Class Name	SOP Class UID	SCU	SCP
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Yes	No

Note: Any SOP specific behavior is documented later in the conformance statement in the applicable SOP specific conformance section.

4.2.2.2. Association Policies

Each AE specification contains a description of the general association establishment and acceptance policies of the AE.

4.2.2.2.1. General

The DICOM standard application context is specified below.

Table 45: DICOM Application Context

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

4.2.2.2.2. Number of Associations

The number of simultaneous associations that an Application Entity may support as a Initiator or Acceptor is specified here.

Table 46: Number of associations as an Association Initiator for this AE

Description	Value
Maximum number of simultaneous associations	2

4.2.2.2.3. Asynchronous Nature

Table 47: Asynchronous nature as an Association Initiator for this AE

Description	Value
Maximum number of outstanding asynchronous transactions	Not Applicable

4.2.2.2.4. Implementation Identifying Information

The value supplied for Implementation Class UID and version name are documented here.

Table 48: DICOM Implementation Class and Version for Patient Catalog Service

Attribute	Value
Implementation Class UID	1.2.840.113704.7.0.2
Implementation Version Name	MxView_3.5

4.2.2.2.5. Communication Failure Handling

The behavior of the AE during communication failure is summarized in the next table.

Table 49: Communication Failure Behavior

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and the command is marked as failed. The reason is logged and reported to the user.

4.2.2.3. Association Initiation Policy

The Application Entity will respond to a received Association rejection as shown in the next table.

Table 50: Association Rejection response

Result	Source	Reason/Diagnosis	Behavior
1 - rejected-permanent	1 - DICOM UL service-user	1 - no-reason-given	
		2 - applicaton-context-name-not supported	Message on screen
		3 - calling-AE-title-not-recognized	
		7 - called-AE-title-not-recognized	Message on screen
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	
		2 - protocol-version-not-supported	Message on screen
	3 - DICOM UL service-provider(Presentation related function)	1 - temporary-congestion	
		2 - local-limit-exceeded	
2 - rejected-transient	1 - DICOM UL service-user	1 - no-reason-given	
		2 - application-context-name-not-supported	
		3 - calling-AE-title-not-recognized	
		7 - called-AE-title-not-recognized	
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	
		2 - protocol-version-not-supported	
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary-congestion	
		2 - local-limit-exceeded	

4.2.2.3.1. (Real-World) Activity – Modality worklist As SCU

4.2.2.3.1.1. Description and Sequencing of Activities

The GEMINI system initiates an association when the user clicks on the HIS/RIS icon in the toolbar.

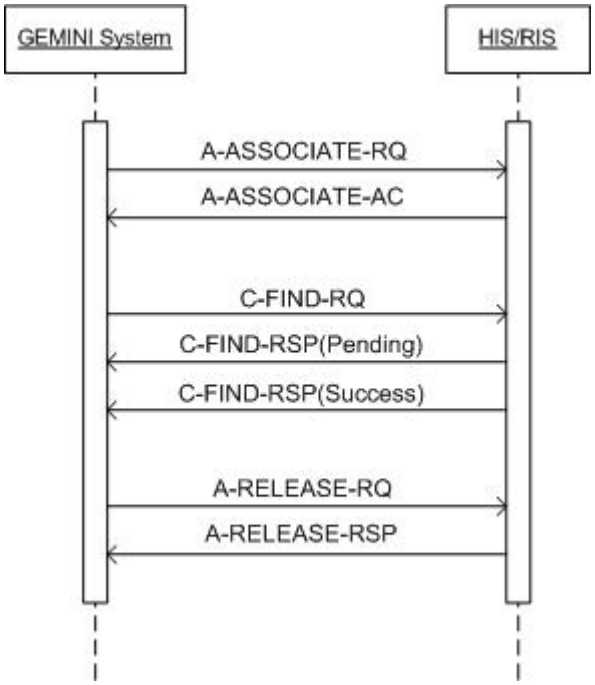

Figure 16: (Real World) Activity - Worklist Request (C-FIND)

4.2.2.3.1.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 51: Proposed Presentation Contexts for (Real-World) Activity – Modality worklist As SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.2.3.1.3. SOP Specific Conformance for Modality Worklist Information Model - FIND SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.2.3.1.3.1. Dataset Specific Conformance for Modality Worklist Information Model - FIND SOP Class C-FIND-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section. The table below should be read as follows:

Attribute Name: Attributes supported to build a Modality Worklist Request Identifier.
Tag: DICOM tag for this attribute.
VR: DICOM VR for this attribute.
M: Matching Keys. An “X”indicates that this attribute is used for (automatic) Worklist Update.
R: Return Keys. An “X” will indicate that this attribute will be supplied as a Return Key with zero length for Universal Matching.
Q: Interactive Query Key. An “X” will indicate that this Worklist attribute can be used as a matching key.
D: Displayed Keys. An “X” indicates that this Worklist attribute is displayed to the user during a patient registration dialog.
IOD: An “X” indicates that this Worklist attribute is included into all object Instances created during performance of the related Procedure Step.
Type of matching: The following types of matching exist:

- Single Value Matching
- List of UID Matching
- Wild Card Matching
- Range Matching
- Sequence Matching
- Universal Matching

Table 52: Worklist Request Identifier

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
Patient Identification Module									
Other Patient IDs	0010,1000	LO		X		X	X		
Patient ID	0010,0020	LO		X	X	X	X	Universal	
Patient's Name	0010,0010	PN		X	X	X	X	Single Value, WildCard	
Patient Demographic Module									
Confidentiality Constraint on Patient Data Description	0040,3001	LO		X					
Ethnic Group	0010,2160	SH		X			X		
Patient Comments	0010,4000	LT		X		X	X		
Patient's Age	0010,1010	AS				X			See 11.1.3
Patient's Birth Date	0010,0030	DA		X		X	X		
Patient's Sex	0010,0040	CS		X		X	X		
Patient's Weight	0010,1030	DS		X		X	X		
Patient Medical Module									
Additional Patient History	0010,21B0	LT		X			X		
Allergies	0010,2110	LO		X		X			See 11.1.3
Medical Alerts	0010,2000	LO		X		X			See 11.1.3
Patient State	0038,0500	LO		X		X			

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
Pregnancy Status	0010,21C0	US		X					See 11.1.3
Special Needs	0038,0050	LO		X		X			See 11.1.3
Visit Relationship Module									
Referenced Patient Sequence	0008,1120	SQ		X					
>Referenced SOP Class UID	0008,1150	UI		X					
>Referenced SOP Instance UID	0008,1155	UI		X					
Visit Identification Module									
Admission ID	0038,0010	LO		X					See 11.1.3
Visit Status Module									
Current Patient Location	0038,0300	LO							
SOP Common Module									
Specific Character Set	0008,0005	CS		X			X	Single Value	
Scheduled Procedure Step Module									
Scheduled Procedure Step Sequence	0040,0100	SQ		X					
>Modality	0008,0060	CS	X	X	X	X		Single Value	Can query for PT, CT or both.
>Requested Contrast Agent	0032,1070	LO		X					See 11.1.3
>Scheduled Performing Physician's Name	0040,0006	PN		X					
>Scheduled Procedure Step Description	0040,0007	LO		X		X	X		
>Scheduled Procedure Step ID	0040,0009	SH		X			X		
>Scheduled Procedure Step Location	0040,0011	SH		X					
>Scheduled Procedure Step Start Date	0040,0002	DA	X	X	X	X		Range	
>Scheduled Procedure Step Start Time	0040,0003	TM		X					
>Scheduled Station AE Title	0040,0001	AE	X	X				Single Value	
>Scheduled Protocol Code Sequence	0040,0008	SQ		X			X		
>>Code Meaning	0008,0104	LO		X		X	X		
>>Code Value	0008,0100	SH		X		X	X		
>>Coding Scheme Designator	0008,0102	SH		X		X	X		
Requested Procedure Module									
Names of Intended Recipients of Results	0040,1010	PN		X					
Requested Procedure Comments	0040,1400	LT		X					
Requested Procedure Description	0032,1060	LO		X		X			See 11.1.3
Requested Procedure ID	0040,1001	SH		X	X		X	Single Value	
Study Instance UID	0020,000D	UI		X			X		
Referenced Study Sequence	0008,1110	SQ		X			X		
>Referenced SOP Class UID	0008,1150	UI		X			X		
>Referenced SOP Instance UID	0008,1155	UI		X			X		
Requested Procedure Code Sequence	0032,1064	SQ		X					See 11.1.3
>Code Meaning	0008,0104	LO		X		X			See 11.1.3
>Code Value	0008,0100	SH		X		X			See 11.1.3
>Coding Scheme Designator	0008,0102	SH		X		X			See 11.1.3
Imaging Service Request Module									
Accession Number	0008,0050	SH	X	X	X	X	X	Single Value	
Imaging Service Request Comments	0040,2400	LT		X					
Referring Physician's Name	0008,0090	PN		X		X	X		
Requesting Physician	0032,1032	PN		X		X			See 11.1.3

4.2.2.3.2. (Real-World) Activity – Modality Performed Procedure Step As SCU

4.2.2.3.2.1. Description and Sequencing of Activities

When the user starts the scan, the GEMINI system initiates an association to notify the HIS/RIS system about procedure execution, with the status “IN PROGRESS”.

When the user closes the study, the GEMINI system initiates an association to notify the HIS/RIS about procedure completion.

When sending an N-SET-RQ, a status of “DISCONTINUED” will be sent to the HIS/RIS if not all images have arrived. Otherwise, a status of “COMPLETED” is sent.
The MPPS N-CREATE and MPPS N-SET are always done in two associations.

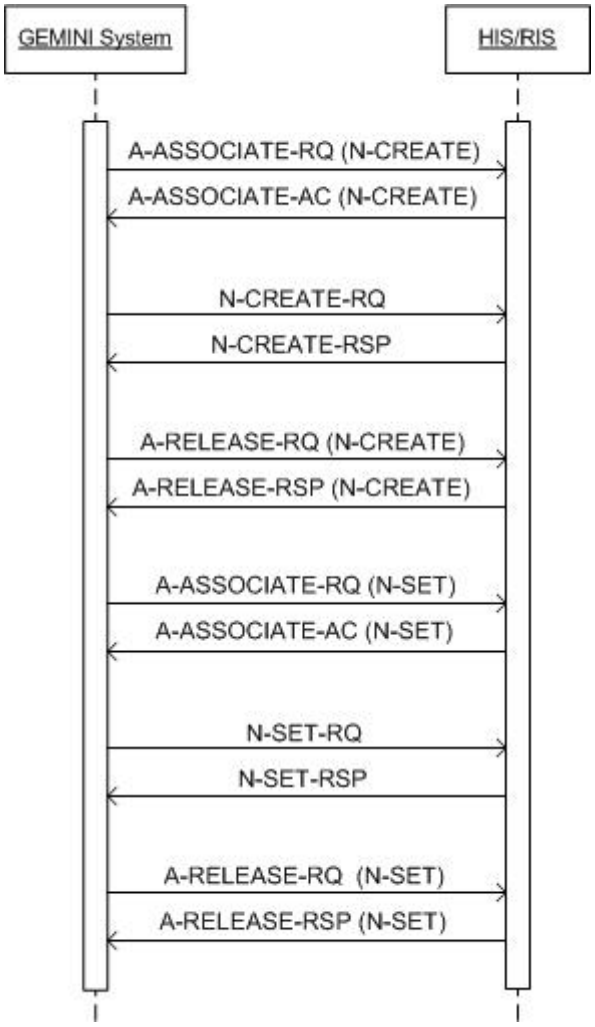

Figure 17: (Real World) Activity – MPPS (N-CREATE, N-SET)

4.2.2.3.2.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 53: Proposed Presentation Contexts for (Real-World) Activity – Modality Performed Procedure Step As SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.2.3.2.3. SOP Specific Conformance for Modality Performed Procedure Step SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.2.3.2.3.1. Dataset Specific Conformance for Modality Performed Procedure Step SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 54: MPPS Request Identifiers for N-CREATE-RQ

Attribute Name	Tag	VR	Value	Comment
Performed Procedure Step Relationship Module				
Patient ID	0010,0020	LO		Acquired from the MWL or user input.
Patient's Birth Date	0010,0030	DA		Acquired from the MWL or user input.
Patient's Name	0010,0010	PN		Acquired from the MWL or user input.
Patient's Sex	0010,0040	CS		Acquired from the MWL or user input.
Referenced Patient Sequence	0008,1120	SQ		Acquired from the MWL.
>Referenced SOP Class UID	0008,1150	UI		Acquired from the MWL.
>Referenced SOP Instance UID	0008,1155	UI		Acquired from the MWL.
Scheduled Step Attributes Sequence	0040,0270	SQ		Acquired from the MWL.
>Accession Number	0008,0050	SH		Acquired from the MWL.
>Requested Procedure Description	0032,1060	LO		Acquired from the MWL.
>Requested Procedure ID	0040,1001	SH		Acquired from the MWL.
>Scheduled Procedure Step Description	0040,0007	LO		Acquired from the MWL.
>Scheduled Procedure Step ID	0040,0009	SH		Acquired from the MWL.
>Study Instance UID	0020,000D	UI		Acquired from the MWL.
>Referenced Study Sequence	0008,1110	SQ		Acquired from the MWL.
>>Referenced SOP Class UID	0008,1150	UI		Acquired from the MWL.
>>Referenced SOP Instance UID	0008,1155	UI		Acquired from the MWL.
>Scheduled Protocol Code Sequence	0040,0008	SQ		Acquired from the MWL.

Attribute Name	Tag	VR	Value	Comment
>>Code Meaning	0008,0104	LO		Acquired from the MWL.
>>Code Value	0008,0100	SH		Acquired from the MWL.
>>Coding Scheme Designator	0008,0102	SH		Acquired from the MWL.
>>Coding Scheme Version	0008,0103	SH		Acquired from the MWL.
Performed Procedure Step Information Module				
Performed Location	0040,0243	SH		Empty.
Performed Procedure Step Description	0040,0254	LO		Acquired from the MWL.
Performed Procedure Step End Date	0040,0250	DA		Empty.
Performed Procedure Step End Time	0040,0251	TM		Empty.
Performed Procedure Step ID	0040,0253	SH		Generated by the system.
Performed Procedure Step Start Date	0040,0244	DA		Generated by the system.
Performed Procedure Step Start Time	0040,0245	TM		Generated by the system.
Performed Procedure Step Status	0040,0252	CS	IN PROGRESS	Generated by the system.
Performed Procedure Type Description	0040,0255	LO		Empty.
Performed Station AE Title	0040,0241	AE		Local system's AE title.
Performed Station Name	0040,0242	SH		
Procedure Code Sequence	0008,1032	SQ		Acquired from the MWL.
>Code Meaning	0008,0104	LO		Acquired from the MWL.
>Code Value	0008,0100	SH		Acquired from the MWL.
>Coding Scheme Designator	0008,0102	SH		Acquired from the MWL.
Image Acquisition Results Module				
Modality	0008,0060	CS	CT	Generated by the system.
Study ID	0020,0010	SH		Generated by the system.
Performed Protocol Code Sequence	0040,0260	SQ		Empty Sequence.
Performed Series Sequence	0040,0340	SQ		Empty Sequence.
Radiation Dose Module				
Comments on Radiation Dose	0040,0310	ST		Empty.
Distance Source to Detector	0018,1110	DS		Empty.
Total Number of Exposures	0040,0301	US		Empty.
Exposure Dose Sequence	0040,030E	SQ		Empty sequence.

4.2.2.3.2.3.2. Dataset Specific Conformance for Modality Performed Procedure Step SOP Class N-SET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 55: MPPS Request Identifiers for N-SET-RQ

Attribute Name	Tag	VR	Value	Comment
Performed Procedure Step Information Module				
Performed Procedure Step Description	0040,0254	LO		Acquired from the MWL.
Performed Procedure Step End Date	0040,0250	DA		Generated by the system.
Performed Procedure Step End	0040,0251	TM		Generated by the

Attribute Name	Tag	VR	Value	Comment
Time				system.
Performed Procedure Step Status	0040,0252	CS	COMPLETED, DISCONTINUED	
Performed Procedure Type Description	0040,0255	LO		Empty.
Procedure Code Sequence	0008,1032	SQ		Acquired from the (0032,1064) sequence on the MWL.
>Code Meaning	0008,0104	LO		Acquired from the (0032,1064) sequence on the MWL.
>Code Value	0008,0100	SH		Acquired from the (0032,1064) sequence on the MWL.
>Coding Scheme Designator	0008,0102	SH		Acquired from the (0032,1064) sequence on the MWL.
Image Acquisition Results Module				
Performed Protocol Code Sequence	0040,0260	SQ		Acquired from the (0040,0100) sequence on the MWL.
>Code Meaning	0008,0104	LO		Acquired from the (0040,0100) sequence on the MWL.
>Code Value	0008,0100	SH		Acquired from the (0040,0100) sequence on the MWL.
>Coding Scheme Designator	0008,0102	SH		Acquired from the (0040,0100) sequence on the MWL.
Performed Series Sequence	0040,0340	SQ		Generated by the system.
>Operators' Name	0008,1070	PN		User input.
>Performing Physician's Name	0008,1050	PN		User input.
>Protocol Name	0018,1030	LO		Generated by the system.
>Retrieve AE Title	0008,0054	AE		Local system's AE title.
>Series Description	0008,103E	LO		User input.
>Series Instance UID	0020,000E	UI		Generated by the system.
>Referenced Image Sequence	0008,1140	SQ		Generated by the system.
>>Referenced SOP Class UID	0008,1150	UI		Generated by the system.
>>Referenced SOP Instance UID	0008,1155	UI		Generated by the system.
>Referenced Non-Image Composite SOP Instance Sequence	0040,0220	SQ		Empty sequence.
>>Referenced SOP Class UID	0008,1150	UI		Not applicable (empty sequence).
>>Referenced SOP Instance UID	0008,1155	UI		Not applicable (empty sequence).
Radiation Dose Module				
Comments on Radiation Dose	0040,0310	ST		Includes CTDI/DLP per acquisition and total DLP. Generated by the system.
Distance Source to Detector	0018,1110	DS		Generated by the system.
Total Number of Exposures	0040,0301	US		Generated by the system.
Exposure Dose Sequence	0040,030E	SQ		Generated by the system.

Attribute Name	Tag	VR	Value	Comment
>KVP	0018,0060	DS		Generated by the system.
>Exposure Time	0018,1150	IS		Generated by the system.
>Radiation Mode	0018,115A	CS		Generated by the system.
>Filter Type	0018,1160	SH		Generated by the system.
>Filter Material	0018,7050	CS		Generated by the system.
>X-Ray Tube Current in uA	0018,8151	DS		Generated by the system.
>CTDIvol	0018,9345	FD		Generated by the system.
>ELSCINT1_DLP_TOTAL (private)	00E1,1021	DS		Generated by the system.

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4.2.2.4. Association Acceptance Policy

The Application Entity may reject Association attempts as shown in the table below.

Table 56: Association Reject Reasons

Result	Source	Reason/Diagnosis	Behavior
1 - rejected permanent	1 - DICOM UL service-user	1 - no-reason-given	
		2 - application-context-name-not-supported	
		3 - calling-AE-title-not-recognized	
		7 - called-AE-title-not-recognized	
	2 - DICOM UL service provider (ACSE related function)	1 - no-reason-given	
		2 - protocol-version-not-supported	
	3 - DICOM UL service provider (Presentation related function)	1 - temporary-congestion	
		2 - local-limit-exceeded	
2 - rejected-transient	1 - DICOM UL service-user	1 - no-reason-given	
		2 - application-context-name-not-supported	
		3 - calling-AE-title-not-recognized	
		7 - called-AE-title-not-recognized	
	2 - DICOM UL service provider (ACSE related function)	1 - no-reason-given	
		2 - protocol-version-not-supported	
	3 - DICOM UL service provider (Presentation related function)	1 - temporary-congestion	
		2 - local-limit-exceeded	

The behavior of the AE for sending an Association abort is summarized in next table.

Table 57: Association Abort Policies

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	
	1 - unrecognized-PDU	
	2 - unexpected-PDU	
	4 - unrecognized-PDU parameter	
	5 - unexpected-PDU parameter	
	6 - invalid-PDU-parameter value	

4.2.3. Print Manager

Detail of this specific Application Entity is specified in this section.

4.2.3.1. SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

Table 58: SOP Classes for Print Manager

SOP Class Name	SOP Class UID	SCU	SCP
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No
>Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No

Note: Any SOP specific behavior is documented later in the conformance statement in the applicable SOP specific conformance section.

4.2.3.2. Association Policies

Each AE specification contains a description of the general association establishment and acceptance policies of the AE.

4.2.3.2.1. General

The maximum PDU Size that the Print-Manager will use is configurable, with a minimum of 2 Kbytes.

Table 59: DICOM Application Context

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

4.2.3.2.2. Number of Associations

Table 60: Number of associations as an Association Initiator for this AE

Description	Value
Maximum number of simultaneous associations	1

4.2.3.2.3. Asynchronous Nature

Print-Manager will only allow a single outstanding operation on an association.

Table 61: Asynchronous nature as an Association Initiator for this AE

Description	Value
Maximum number of outstanding asynchronous transactions	1

4.2.3.2.4. Implementation Identifying Information

The value supplied for Implementation Class UID and version name are documented here.

Table 62: DICOM Implementation Class and Version for Print Manager

Attribute	Value
Implementation Class UID	1.3.46.670589.33.1.1
Implementation Version Name	BRCONN_4.0

4.2.3.3. Association Initiation Policy

The Application Entity will respond to a received Association rejection as shown in the next table.

Table 63: Association Rejection response

Result	Source	Reason/Diagnosis	Explanation
1 - rejected-permanent	1 - DICOM UL service-user	1 - no-reason-given	The connection is closed.
		2 - application-context-name-not supported	The connection is closed.
		3 - calling-AE-title-not-recognized	The connection is closed.
		7 - called-AE-title-not-recognized	The connection is closed.
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	The connection is closed.
		2 - protocol-version-not-supported	The connection is closed.
	3 - DICOM UL service-provider(Presentation related function)	1 - temporary-congestion	The connection is closed.
		2 - Local-limit-exceeded	The connection is closed.
2 - rejected-transient	1 - DICOM UL service-user	1 - no-reason-given	The connection is closed.
		2 - application-context-name-not-supported	The connection is closed.
		3 - calling-AE-title-not-recognized	The connection is closed.
		7 - called-AE-title-not-recognized	The connection is closed.
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	The connection is closed.

Result	Source	Reason/Diagnosis	Explanation
		2 - protocol-version-not-supported	The connection is closed.
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary congestion	The connection is closed.
		2 - local-limit-exceeded	The connection is closed.

The behavior of the AE on receiving an association abort is summarized in next table.

Table 64: Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	The connection is closed.
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	The connection is closed.
	1- unrecognized-PDU	The connection is closed.
	2 - unexpected-PDU	The connection is closed.
	4 - unrecognized-PDU parameter	The connection is closed.
	5 - unexpected-PDU parameter	The connection is closed.
	6 - invalid-PDU-parameter value	The connection is closed.

4.2.3.3.1. (Real-World) Activity – Print Management As SCU

4.2.3.3.1.1. Description and Sequencing of Activities

After selecting the print destination (out of choice list of configured printers) and some print parameters (depending on the configuration and the selected printer; these values can be configured too), Print-Manager initiates an association when a print job is submitted to a DICOM printer (when the user clicks on the print button in the film view). The association is left open after the job is completed for a configurable time-out (so that if there are other jobs to the same printer, they will be done on the same association). Jobs to different printers are performed simultaneously.

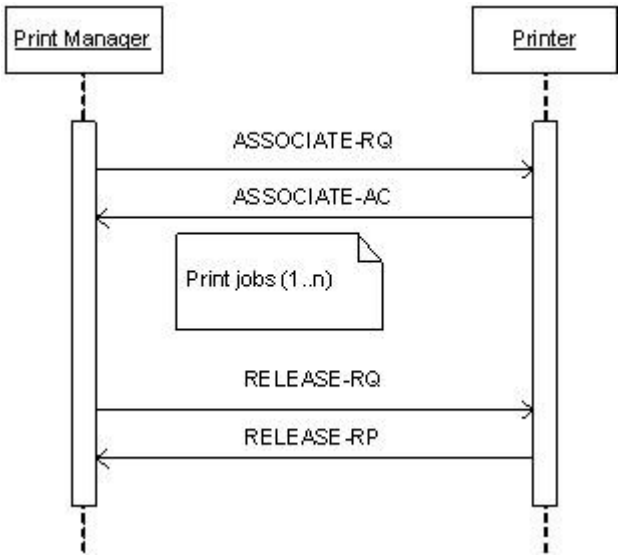

Figure 18: (Real World) Activity - Print Manager Initiates

Normally, when the job is completed and there are no other jobs to the same printer, the Print manager does close the association with an A-RELEASE request. If a TCP/IP connection timeout occurs, then the association is closed. In this case, a new association is set up when needed.

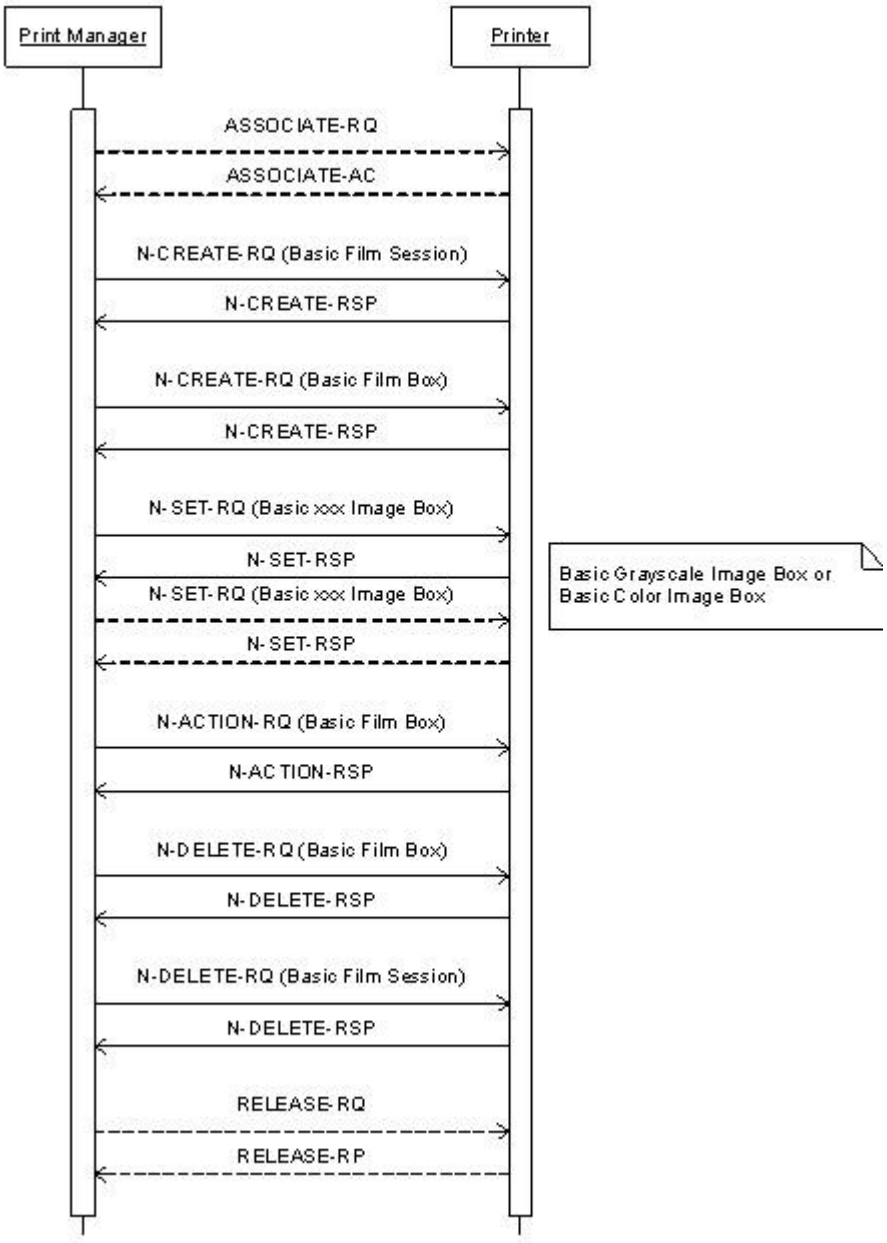

Figure 19: (Real World) Activity - Print Management as SCU

4.2.3.3.1.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 65: Proposed Presentation Contexts for (Real-World) Activity – Print Management As SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18			SCU	None
>Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9			SCU	None
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

Note: The only supported Transfer Syntaxes for printing are ELE and ILE.

This section specifies each IOD created (including private IODs). It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Abbreviations used in the IOD tables for the column "Presence of Module" are:

ALWAYS	The module is always present
CONDITIONAL	The module is used under specified condition

Abbreviations used in the Module table for the column "Presence of Value" are:

ALWAYS	The attribute is always present with a value
EMPTY	The attribute is always present without any value (attribute sent zero length)
VNAP	The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
ANAP	The attribute is present under specified condition – if present then it will always have a value
ANAPCV	The attribute is present under specified condition – if present then its Value is Not Always Present (attribute sent zero length if condition applies and no value is present)
ANAPEV	The attribute is present under specified condition – if present then it will not have any value

The abbreviations used in the Module table for the column "Source" are:

AUTO	The attribute value is generated automatically
CONFIG	The attribute value source is a configurable parameter
COPY	The attribute value source is another SOP instance
FIXED	The attribute value is hard-coded in the application
IMPLICIT	The attribute value source is a user-implicit setting
MPPS	The attribute value is the same as that use for Modality Performed Procedure Step
MWL	The attribute value source is a Modality Worklist
USER	The attribute value source is explicit user input

Items in the Value and Comment columns in the following tables are filled in where appropriate to further clarify the use or meaning of each attribute beyond the definition provided by the DICOM Standard. All others are left blank for ease of use. See PS3.3 of the DICOM Standard for the complete attribute definitions.

4.2.3.3.1.3. SOP Specific Conformance for Basic Color Image Box SOP Class of the Basic Color Print Management Meta SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

The Printer process conforms to the Color Image Box Sop Class. The following DIMSE service element is supported: N-SET

4.2.3.3.1.3.1. Dataset Specific Conformance for Basic Color Image Box SOP Class N-SET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 66: Image Box Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Box Position	2020,0010	US	1	ALWAYS	AUTO	
Polarity	2020,0020	CS		ALWAYS	AUTO	As in printer configuration file.
Basic Color Image Sequence	2020,0111	SQ		ALWAYS	AUTO	
>Bits Allocated	0028,0100	US	8	ALWAYS	AUTO	
>Bits Stored	0028,0101	US	8	ALWAYS	AUTO	
>Columns	0028,0011	US		ALWAYS	AUTO	As in printer configuration file.
>High Bit	0028,0102	US	7	ALWAYS	AUTO	
>Photometric Interpretation	0028,0004	CS	RGB	ALWAYS	AUTO	
>Pixel Aspect Ratio	0028,0034	IS		ALWAYS	AUTO	Must be present if not 1/1.
>Pixel Data	7FE0,0010	OW OB		ALWAYS	AUTO	
>Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	
>Planar Configuration	0028,0006	US	1, 0	ALWAYS	AUTO	
>Rows	0028,0010	US		ALWAYS	AUTO	As in printer configuration file.
>Samples per Pixel	0028,0002	US	3	ALWAYS	AUTO	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 67: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Image successfully stored in Image Box	The print job continues.
Warning	B604	Image Size is larger than Image Box Size - The Image has been de-magnified	The print job continues and the warning is logged and reported to the user.
	B605	Requested Min Density or Max Density outside of Printer's operating Range	The print job continues and the warning is logged and reported to the user.
	B609	Image Size is larger than Image Box Size - The Image has been cropped to fit	The print job continues and the warning is logged and reported to the user.
	B60A	Image Size or combined Print Image Size is larger than Image Box Size - The Image or combined Print Image has been decimated to fit	The print job continues and the warning is logged and reported to the user.
Error	C603	Image Size is larger than Image Box Size	The print job is marked as failed and the reason is logged and reported to the user.
	C605	Insufficient Memory in Printer to store the Image	The print job is marked as failed and the reason is logged and reported to the user.
	C613	Combined Print Image Size is larger than Image Box Size	The print job is marked as failed and the reason is logged and reported to the user.

4.2.3.3.1.4. SOP Specific Conformance for Basic Film Box SOP Class of the Basic Color Print Management Meta SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.
The Printer process conforms to the Basic Film Box Sop Class. The following DIMSE service elements are supported: N-CREATE, N-ACTION, N-DELETE.

4.2.3.3.1.4.1. Dataset Specific Conformance for Basic Film Box SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 68: Basic Film Box Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Configuration Information	2010,0150	ST		ALWAYS	CONFIG	As in printer configuration file.
Film Orientation	2010,0040	CS	LANDSCAPE, PORTRAIT	ALWAYS	CONFIG, USER	
Film Size ID	2010,0050	CS		ALWAYS	CONFIG, USER	As in printer configuration file.
Image Display Format	2010,0010	ST	STANDARD\1,1	ALWAYS	FIXED	
Magnification Type	2010,0060	CS		ALWAYS	CONFIG	As in printer configuration file.
Max Density	2010,0130	US		ALWAYS	CONFIG	As in printer configuration file.
Min Density	2010,0120	US		ALWAYS	CONFIG	As in printer configuration file.
Trim	2010,0140	CS	NO, YES	ALWAYS	CONFIG, USER	

Table 69: Basic Film Box Relationship Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Film Session Sequence	2010,0500	SQ		ALWAYS	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	UID of Parent Film Session.
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 70: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Box successfully created	The SCP has completed the operation successfully.
Warning	B605	Requested Min Density or Max Density outside of Printer's operating Range	The print job continues and the warning is logged.
Failure	C616	There is an existing Film Box that has not been printed	The print job is marked as failed and the reason is logged.

4.2.3.3.1.4.2. Dataset Specific Conformance for Basic Film Box SOP Class N-ACTION-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 71: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film accepted for printing	The print job continues.
Warning	B603	Film Box SOP Instance Hierarchy does not contain Image Box SOP Instances	The print job continues and the warning is logged and reported to the user.
	B604	Image Size is larger than Image Box Size - The Image has been de-magnified	The print job continues and the warning is logged and reported to the user.
	B609	Image Size is larger than Image Box Size - The Image has been cropped to fit	The print job continues and the warning is logged and reported to the user.
	B60A	Image Size or combined Print Image Size is larger than Image Box Size - The Image or combined Print Image has been decimated to fit	The print job continues and the warning is logged and reported to the user.
Failure	C602	Unable to create Print Job SOP Instance - Print Queue is full	The print job is marked as failed and the reason is logged and reported to the user.
	C603	Image Size is larger than Image Box Size	The print job is marked as failed and the reason is logged and reported to the user.
	C613	Combined Print Image Size is larger than Image Box Size	The print job is marked as failed and the reason is logged and reported to the user.

4.2.3.3.1.4.3. Dataset Specific Conformance for Basic Film Box SOP Class N-DELETE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 72: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Session successfully created	The SCP has completed the operation successfully
Other than Success	<>0000	Any other status then success	The job remains in the queue manager, with status failed

4.2.3.3.1.5. SOP Specific Conformance for Basic Film Session SOP Class of the Basic Color Print Management Meta SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

The Printer process conforms to the Basic Film Session SOP Class. The following DIMSE service elements are supported: N-CREATE, N-DELETE.

4.2.3.3.1.5.1. Dataset Specific Conformance for Basic Film Session SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 73: Basic Film Session Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Film Destination	2000,0040	CS	MAGAZINE, PROCESSOR	ALWAYS	CONFIG, USER	
Medium Type	2000,0030	CS	BLUE FILM, CLEAR FILM, PAPER	ALWAYS	CONFIG, USER	
Number of Copies	2000,0010	IS		ALWAYS	USER	Value between 1-100
Print Priority	2000,0020	CS	HIGH, LOW, MED, AUTO	ANAP	USER	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 74: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Session successfully created	The print job continues.
Warning	B600	Memory Allocation not supported	The print job continues and the warning is logged.

4.2.3.3.1.5.2. Dataset Specific Conformance for Basic Film Session SOP Class N-DELETE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 75: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Session successfully created	The SCP has completed the operation successfully.
Other than Success	<>0000	Other status	On any other status then success, the job remains in the queue manager, with status failed.

4.2.3.3.1.6. SOP Specific Conformance for Printer SOP Class of the Basic Color Print Management Meta SOP Class

Not applicable, Printer SOP Class is not supported.

4.2.3.3.1.6.1. Dataset Specific Conformance for Printer SOP Class N-EVENT-REPORT-SCP

Not applicable, Printer SOP Class is not supported.

4.2.3.3.1.7. SOP Specific Conformance for Basic Film Box SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

The Printer process conforms to the Basic Film Box Sop Class. The following DIMSE service elements are supported: N-CREATE, N-ACTION, N-DELETE.

4.2.3.3.1.7.1. Dataset Specific Conformance for Basic Film Box SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 76: Basic Film Box Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Configuration Information	2010,0150	ST		ALWAYS	CONFIG	As in printer configuration file.
Film Orientation	2010,0040	CS	LANDSCAPE, PORTRAIT	ALWAYS	CONFIG, USER	
Film Size ID	2010,0050	CS		ALWAYS	CONFIG, USER	As in printer configuration file.
Image Display Format	2010,0010	ST	STANDARD\1,1	ALWAYS	FIXED	
Magnification Type	2010,0060	CS		ALWAYS	CONFIG	As in printer configuration file.
Max Density	2010,0130	US		ALWAYS	CONFIG	As in printer configuration file.
Min Density	2010,0120	US		ALWAYS	CONFIG	As in printer configuration file.
Trim	2010,0140	CS	NO, YES	ALWAYS	CONFIG, USER	

Table 77: Basic Film Box Relationship Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Film Session Sequence	2010,0500	SQ		ALWAYS	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	UID of Parent Film Session.
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 78: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Box successfully created	The SCP has completed the operation successfully.
Warning	B605	Requested Min Density or Max Density outside of Printer's operating Range	The print job continues and the warning is logged.
Failure	C616	There is an existing Film Box that has not been printed	The print job is marked as failed and the reason is logged.

4.2.3.3.1.7.2. Dataset Specific Conformance for Basic Film Box SOP Class N-ACTION-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 79: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film accepted for printing	The print job continues.
Warning	B603	Film Box SOP Instance Hierarchy does not contain Image Box SOP Instances	The print job continues and the warning is logged and reported to the user.
	B604	Image Size is larger than Image Box Size - The Image has been de-magnified	The print job continues and the warning is logged and reported to the user.
	B609	Image Size is larger than Image Box Size - The Image has been cropped to fit	The print job continues and the warning is logged and reported to the user.
	B60A	Image Size or combined Print Image Size is larger than Image Box Size - The Image or combined Print Image has been decimated to fit	The print job continues and the warning is logged and reported to the user.
Failure	C602	Unable to create Print Job SOP Instance - Print Queue is full	The print job is marked as failed and the reason is logged and reported to the user.
	C603	Image Size is larger than Image Box Size	The print job is marked as failed and the reason is logged and reported to the user.
	C613	Combined Print Image Size is larger than Image Box Size	The print job is marked as failed and the reason is logged and reported to the user.

4.2.3.3.1.7.3. Dataset Specific Conformance for Basic Film Box SOP Class N-DELETE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 80: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Session successfully created	The SCP has completed the operation successfully.
Other than Success	<>0000	Other status	On any other status then success, the job remains in the queue manager, with status failed.

4.2.3.3.1.8. SOP Specific Conformance for Basic Film Session SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

The Printer process conforms to the Basic Film Session SOP Class. The following DIMSE service element is supported: N-CREATE, N-DELETE.

4.2.3.3.1.8.1. Dataset Specific Conformance for Basic Film Session SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 81: Basic Film Session Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Film Destination	2000,0040	CS	MAGAZINE, PROCESSOR	ANAP	USER	
Medium Type	2000,0030	CS	BLUE FILM, CLEAR FILM, PAPER	ALWAYS	USER	Value between 1-100
Number of Copies	2000,0010	IS		ALWAYS	CONFIG, USER	
Print Priority	2000,0020	CS	HIGH, LOW, MED, AUTO	ALWAYS	CONFIG, USER	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 82: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Session successfully created	The print job continues.
Warning	B600	Memory Allocation not supported	The print job continues and the warning is logged.

4.2.3.3.1.8.2. Dataset Specific Conformance for Basic Film Session SOP Class N-DELETE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 83: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Session successfully created	The SCP has completed the operation successfully.
Other than Success	<>0000	Other status	On any other status then success, the job remains in the queue manager, with status failed.

4.2.3.3.1.9. SOP Specific Conformance for Basic Grayscale Image Box SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section includes the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

The Printer process conforms to the Basic Grayscale Image Box SOP Class. The following DIMSE service element is supported: N-SET.

4.2.3.3.1.9.1. Dataset Specific Conformance for Basic Grayscale Image Box SOP Class N-SET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 84: Image Box Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Box Position	2020,0010	US	1	ALWAYS	AUTO	
Basic Grayscale Image Sequence	2020,0110	SQ		ALWAYS	AUTO	
>Bits Allocated	0028,0100	US	8	ALWAYS	AUTO	
>Bits Stored	0028,0101	US	8	ALWAYS	AUTO	
>Columns	0028,0011	US		ALWAYS	AUTO	As in printer configuration file.
>High Bit	0028,0102	US	7	ALWAYS	AUTO	
>Photometric Interpretation	0028,0004	CS	MONOCHROME2, RGB	ALWAYS	AUTO	
>Pixel Aspect Ratio	0028,0034	IS		ALWAYS	AUTO	Must be present if not 1/1.
>Pixel Data	7FE0,0010	O W OB		ALWAYS	AUTO	
>Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	
>Rows	0028,0010	US		ALWAYS	AUTO	As in printer configuration file.
>Samples per Pixel	0028,0002	US	3, 1	ALWAYS	AUTO	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, etc.

Table 85: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Image successfully stored in Image Box	The print job continues.
Warning	B604	Image Size is larger than Image Box Size - The Image has been de-magnified	The print job continues and the warning is logged and reported to the user.
	B605	Requested Min Density or Max Density outside of Printer's operating Range	The print job continues and the warning is logged and reported to the user.
	B609	Image Size is larger than Image Box Size - The Image has been cropped to fit	The print job continues and the warning is logged and reported to the user.
	B60A	Image Size or combined Print Image Size is larger than Image Box Size - The Image or combined Print Image has been decimated to fit	The print job continues and the warning is logged and reported to the user.
Error	C603	Image Size is larger than Image Box Size	The print job is marked as failed and the reason is logged and reported to the user
	C605	Insufficient Memory in Printer to store the Image	The print job is marked as failed and the reason is logged and reported to the user
	C613	Combined Print Image Size is larger than Image Box Size	The print job is marked as failed and the reason is logged and reported to the user

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4.3. Network Interfaces

4.3.1. Physical Network Interfaces

The System provides only DICOM V3.0 TCP/IP Network Communication Support as defined in PS 3.8 of the standard.
TCP/IP is the only protocol stack supported.
Supported physical medium include:
IEEE 802.3, 10BASE-T
IEEE 802.3, 100BASE-TX (Fast Ethernet)
IEEE 802.3, 1000BASE-X (Fiber Optic Gigabit Ethernet).

The TCP/IP Stack is supported by the underlying Operating System.
The API is the WinSock 2 interface as supported by the underlying Operating System.

4.3.2. Additional Protocols

Additional protocols such as used for network management are not applicable.

4.4. Configuration

Any implementation's DICOM conformance may be dependent upon configuration, which takes place at the time of installation. Issues concerning configuration are addressed in this section.

4.4.1. AE Title/Presentation Address Mapping

The GEMINI system is configured by means of a configuration program. This program is accessible at start-up of the GEMINI system. It is password protected and intended to be used by the administrator onsite or Philips Customer Support Engineers only.

The system accepts associations from a range of IP addresses (it will not check source IP or Calling AE Title). This is configurable in the LAN Config application.
This mapping (including IP and port numbers) is defined during the system Networking Procedure. Configurable are the following parameters:

- Calling AE Titles.
- Called AE Titles.
- Maximum PDU size.
- Manufacturer.
- Model.
- Version.
- Association timeout, the minimum configurable timeout value is "1".
- ARTIM timer.
- Large Archive - Force Filter when querying this device.
- Archived - Mark studies as Archived when copying them to this device.
- Disable explicit transfer syntaxes are proposed at the association negotiation.
- Enable generation of DICOM overlays ("burn-in" instead).

4.4.1.1. Local AE Titles

The local AE title mapping and configuration are specified as:

Table 86: AE Title configuration table

Application Entity	Default AE Title	Default TCP/IP Port
DICOM-Manager	<hostname>; <hostname><localfolder>	104 (configurable)
Print Manager	<hostname>	Configurable

4.4.1.2. Remote AE Title/Presentation Address Mapping

Remote AE Title, IP-Address, Port-number and supporting Transfer Syntaxes are freely configurable.

4.4.2. Parameters

The specification of important operational parameters, their default value and range (if configurable) is specified here.

Table 87: Configuration Parameters Table

General Parameter	Configurable	Default Value
Release Timeout	Yes	30 seconds (LAN Config)
Port-Number	Yes	104 (Fixed)
Maximum PDU size the AE can receive	Yes	16352 (Fixed)
Maximum PDU size the AE can send	Yes	16352 (Fixed)
Transfer Syntax support, P- ELE, JPEG, ELE, ILE, There is a configuration option to turn off Explicit VR support	Yes	Private ELE, ELE, ILE
Storage / Retrieve Timeout	Yes	300 seconds (LAN Config)
ARTIM timeout	Yes	300 seconds (LAN Config)
Max association number	Yes	50

Printers are configurable by a selection of the default printer types. Every printer type has a fixed configuration, but can be extended with new ones. The default printer settings are defined in the printer configuration file.

4.4.3. PET Configuration

Several system configuration options govern generation of PET Image objects. These include:

Table 88: PET Image Configuration Table

General Parameter	Configurable	Default Value
PET image Units (0054,1001). Choices are counts (CNTS) or activity concentration (BQML).	Yes	BQML for new systems, CNTS for upgraded systems.
Whether or not a default Blending Softcopy Presentation State object should be generated automatically	Yes	No

5. MEDIA INTERCHANGE

5.1. Implementation model

5.1.1. Application Data Flow Diagram

As part of the implementation model, an application data flow diagram is included. The next Figure shows the media interchange application data flow as a functional overview of the Media AE for DICOM CD and DVD.

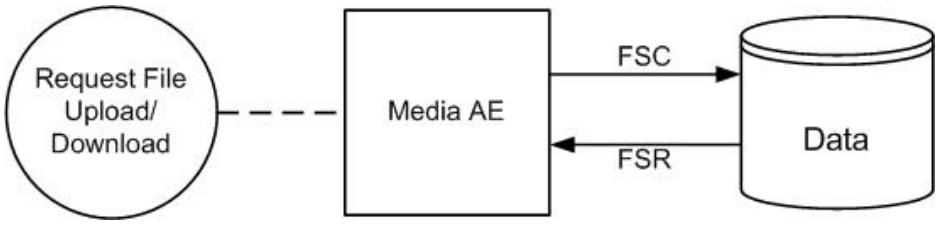

Figure 20: Media Interchange Application Data Flow Diagram

The Media AE acts as a FSR when reading the directory of the medium. The Media AE acts as a FSC when writing the selected images in a patient folder onto the CD-R / DVD medium.

The Media AE acts as a FSR, for CD-R and DVD, when reading the directory of the medium. The Media AE acts as a FSC for CD-R and DVD, when writing the selected images in a patient folder onto the medium. GEMINI supports the media profiles as shows in the Table below:

Table 89: Media Profiles supported by GEMINI

Supported Application Profile	Real-World Activity	Roles	SC Option
STD-GEN-CD	Display Directory	FSR	Interchange
	Write Images	FSC	Interchange
	Read Images	FSR	Interchange
STD-GEN-DVD-JPEG	Display Directory	FSR	Interchange
	Write Images	FSC	Interchange
	Read Images	FSR	Interchange

The system proposes the transfer syntaxes mentioned in Table below.

Table 90: Transfer Syntaxes of DVD / CD supported by GEMINI

Abstract Syntax Name	Abstract Syntax UID	Transfer Syntax Name	Transfer Syntax UID	Role	Ext. Neg.
See Note 1	See Note 1	Private ELE	1.3.46.670589.33.1.4.1	SCU	None
		JPEG	1.2.840.10008.1.2.4.70		None
		ILE	1.2.840.10008.1.2		None
		ELE (Note 2)	1.2.840.10008.1.2.1		None

Note 1: Any of the standard image storage and private SOP classes mentioned before.
Note 2: The preferred transfer syntax for media is default ELE.

5.1.2. Functional Definitions of AEs

This session contains a functional definition for each local Application Entity. It's described in general terms the functions to be performed by the AE, and the DICOM services used to accomplish these functions.

The Media AE includes the following service class.

Media Storage Service Class for CD and DVD.

The GEMINI system can perform the CD Media Storage service as SCU, with capabilities for:
RWA Display Directory (as FSR),
RWA Write Images (as FSC), and
RWA Read Images (as FSR).

The GEMINI system can perform the DVD Media Storage service as SCU, with capabilities for:
RWA Display Directory (as FSR),
RWA Write Images (as FSC), and
RWA Read Images (as FSR).

The GEMINI system can Create and Read CD /DVD and Read CD/DVD.

Functional Definition of GEMINI Media AE

The Media AE in a GEMINI system supports the following functions for CD and DVD as FSR:

- Read the DICOMDIR File from the medium (representing the directory of the DICOM File(s) as recorded on the medium). This information may be displayed as an ordered list of icon images and, if present, with pertinent identifying information (patient name, etc.).

- Read the selected image from the medium and display it. This information is displayed as an ordered list of frames of the selected image or as a dynamic review of the selected image.

The Media AE in a GEMINI system supports the following functions for CD and DVD as FSC:
- Initialize the medium.
- Write a DICOM File-set onto the medium.
- Create a DICOMDIR File.
- Extend the DICOM File-set and update the DICOMDIR File accordingly (DICOM Media Storage Service Class).

5.1.3. Sequencing of Real World Activities

A Real World Activity of the Media AE is: The user selects a set of object to write these to the CD/DVD. Then the CD /DVD will be created with the selected objects. Once the CD/DVD has been created, the user can read this CD/DVD on the GEMINI system or for transport to another device for reading.

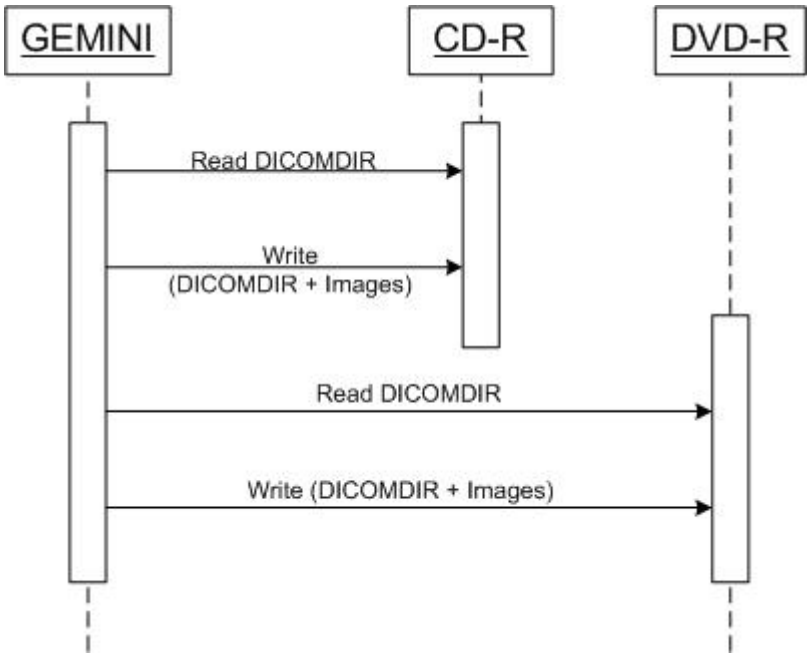

Figure 21: (Real World) Activity - Media

Another Real World Activity of the Media AE is: A CD/DVD from another GEMINI system or previously created CD/DVD can be read by the GEMINI system. The GEMINI system cannot append (FSU) to this created CD/DVD.

After data is written to DVD, the DVD is finalized; the finalized DVD can now be read on mostly every DVD reader.

5.2. AE Specifications

This section in the DICOM Conformance Statement specifies a set of Media Application Entities.

5.2.1. Media AE - Specification

For reading and writing the media AE provides standard conformance to:
- DICOM media Storage Service and File Format ([DICOM] PS 3.10);
- Media Storage Application Profiles ([DICOM] PS 3.11); and
- Media Formats and Physical Media for Media Interchange ([DICOM] PS 3.12) for Reading (FSR) and Writing (FSC).

The GEMINI system does not support multi-patient and multi-session CD / DVD disks, both for Reading and Writing.

Supported media:
- CD: CD-R and CD-RW with the profile STD-GEN-CD.
- DVD: DVD-R, DVD+R, DVD-RW and DVD+RW with the profile STD-GEN-DVD-JPEG.

The supported Application Profiles, their roles and the Service Class (SC) options, all defined in DICOM terminology, are listed in the next Table.

Table 91: Media AE related Application Profiles, RWA activities and roles

Supported Application Profile	Identifier	Real-World Activities	Roles
CT/MR Studies on CD-R	STD-CTMR-CD	Create File-set	FSC
		Read File-set	FSR
General Purpose CD-R Interchange	STD-GEN-CD	Create File-set	FSC
		Read File-set	FSR
General Purpose DVD Interchange with JPEG	STD-GEN-DVD-JPEG	Create File-set	FSC
		Read File-set	FSR

5.2.1.1. File Meta Information for the Media AE

This section contains the values of the file Meta Information that pertain to the Application Entity (see PS 3.10). These are:
- Source Application Entity Title,
- Private Information Creator UID,
- Private Information.

The Application Entity title is registered into the DICOM File Meta Information header and is supported by the CD/DVD-Writer (CD/DVD write option) acting as a FSC.

Table 92: File Meta Information for the Media AE

Attribute	Value
Implementation Class UID	1.2.46.670589.33.1.1
Implementation Version Name	BRCONN_4.0

5.2.1.2. Real-World Activities

The AE specification contains a description of the Real-World Activities, which invoke the particular AE.

5.2.1.2.1. RWA - Read File-set

This Media Application Entity has a File-set Reader functionality which is describe here.

Display Directory

When a database open action is initiated on the CD/DVD then the Media AE acts as an FSR using the interchange option to read the DICOMDIR of the CD/DVD media. This will result in an overview of the patients, studies, series and images on the GEMINI screen.

Read Images

When an image transfer from CD or DVD is initiated then the Media AE acts as an FSR using the interchange option to import SOP Instances from the CD or DVD medium.

5.2.1.2.1.1. Media Storage Application Profile

The application Profile that is used by this Media Application Entity is specified in this section.

Display Directory

As depicted in the table in section 5.2.1, the Media AE supports the RWA Display Directory for the STD-CTMR-CD, STD-GEN-CD and the STD-GEN-DVD-JPEG Application Profiles.

Read Images

As depicted in the table in section 5.2.1, the Media AE supports the RWA Read Images for the Application Profile.

The mandatory attributes of the DICOM images are required for the correct storage of the images in the GEMINI internal image database.

Optional attributes and Retired/Private attributes are stored too - if present; this is equivalent with the level 2 (Full) conformance for the Storage Service Class in the Network support.

5.2.1.2.1.1.1. Options

The options used in the Application Profile are specified in detail in this section.

Display Directory

The mandatory DICOMDIR keys are required for the correct display of directory information. The display is structured according the DICOM Composite Information Model: Patient, Study, Series, and Image.

The DICOM standard specifies certain attributes of the DICOMDIR as mandatory. However, these attributes may not be mandatory for the related SOP class IOD. For those attributes the default values apply.

Read Images

Not applicable.

5.2.1.2.2. RWA - Create File-set

This Media Application Entity has a File-set Creator functionality which is describe here.

When an image transfer to CD/DVD is initiated then the Media AE acts as an FSC using the interchange option to export SOP Instances from the local database to a CD/DVD medium.

5.2.1.2.2.1. Media Storage Application Profile

The application Profile that is used by this Media Application Entity is specified in this section.

As depicted in the table in section 5.2.1, the Media AE supports the RWA Write Images for the STD-CTMR-CD, STD-GEN-CD and the STD-GEN-DVD-JPEG Application Profile.

The DICOMDIR file will be extended when new images are written. In case some attributes are not present in an image but are specified as mandatory in the DICOMDIR definition in DICOM Media, a generated value will be filled in.

Implementation remarks and restrictions

When writing the DICOMDIR records, key values are generated when no value of the corresponding attribute is supplied, according to the following tables.

Table 93: Generated Keys

Key	Tag	Generated Value
Study Keys		
Study Date	(0008,0020)	Date on which this Study was created.
Study Time	(0008,0030)	Time on which this Study was created.
Study Keys		
Series Number	(0020,0011)	1
Image Keys		
Instance Number	(0020,0013)	1 (if empty)

The data selected to write to the media must fit on the currently inserted media. If it does not fit, an error is generated and it is up to the operator to re-select a smaller amount of data to be written to the media. The system will not request additional media or write across multiple media.

Table 94: Supported attributes in the DICOMDIR

DICOM Tag	Description
0002,0000	Group 0002 Length
0002,0001	File Meta Information Version
0002,0002	UI Media Storage Sop Class UID
0002,0003	UI Media Storage Sop Instance UID
0002,0010	UI Transfer Syntax UID
0002,0012	UI Implementation Class UID

DICOM Tag	Description
0002,0013	Implementation Version Name
0002,0016	Source Application Entity Title
	File Set and Directory Information
0004,1130	File Set ID
0004,1200	First Directory Record Offset
0004,1202	Last Directory Record Offset
0004,1212	File Set Consistency Flag
0004,1220	Directory Record Sequence
	Patient level
0004,1400	Offset Of The Next Dir Record
0004,1410	Record In Use Flag
0004,1420	Offset of Referenced Lower-Level Directory Entity
0004,1430	Directory Record Type
0010,0010	Patient's Name
0010,0020	Patient ID
	Study level
0004,1400	Offset Of The Next Dir Record
0004,1410	Record In Use Flag
0004,1420	Offset Of Ref Lower Level Dir Ent
0004,1430	Directory Record Type
0008,0005	Specific Character Set
0008,0020	Study Date
0008,0030	Study Time
0008,0050	Accession Number
0008,0054	Retrieve AE Title
0008,0061	Modalities in Study
0008,0090	Referring Physician's Name
0010,0030	Patient's Birth Date
0010,0040	Patient's Sex
0040,A120	DateTime
0008,1030	Study Description
0020,000D	Study Instance UID
0020,0010	Study ID
0020,1206	Number Of Study Related Series
0020,1208	Number Of Study Related Images
	Series level
0004,1400	Offset Of The Next Dir Record
0004,1410	Record In Use Flag
0004,1420	>Offset of Referenced Lower-Level Directory Entity
0004,1430	Directory Record Type
0008,0060	Modality
0008,0070	Manufacturer
0020,000E	Series Instance UID
0020,0011	Series Number
0020,1209	Number of Series Related Instances
	Image level
0004,1400	Offset Of The Next Dir Record
0004,1410	Record In Use Flag
0004,1420	Offset Of Ref Lower Level Dir Ent
0004,1430	Directory Record Type
0004,1500	Referenced File ID
0004,1510	Referenced Sop Class UID In File
0004,1511	Ref Sop Instance UID In File
0004,1512	Referenced Transfer Syntax UID in FILE
0008,0008	Image Type
0018,0010	Contrast/Bolus Agent
0008,0016	SOP Class UID

DICOM Tag	Description
0008,0018	SOP Instance UID
0008,0023	Content Date
0008,0033	Content Time
0018,0050	Slice Thickness
0018,0060	KVP
0020,0013	Instance Number
0020,0032	Image Position (Patient)
0020,0037	Image Orientation (Patient)
0020,0052	Frame of Reference UID
0028,0002	Samples per Pixels
0028,0004	Photometric Interpretation
0028,0010	Rows
0028,0011	Columns
0028,0030	Pixel Spacing
0028,0100	Bits Allocated

5.3. Augmented and Private Application Profiles

Not applicable

5.4. Media Configuration

Any configuration issues may be found in the Networking Section 4.4 Configuration.

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6. SUPPORT OF CHARACTER SETS

Any support for character sets in Network and Media services is described here.

Table 95: Supported DICOM Character Sets

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
Latin alphabet No. 1	ISO_IR 100	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 100	G1	Supplementary set of ISO 8859
Default repertoire	-	-	ISO-IR 6	G0	ISO 646
		-	-	-	-

Localization settings for the Interface, Reports and Keyboard can be configured in the Preferences Menu under Regional Setting.

For Value Representation (VR) equal to Patient's Name (PN), the leading spaces into the Patient's Name will be treated as insignificant for matching purposes.

From the Patient's Name only the first 32 characters are displayed into the Quick View Viewer.

In the Patient's data with Data Time information, only the 3 Fractional digits of the Data Time Format are supported.

7. SECURITY

7.1. Security Profiles

7.1.1. Security use Profiles

Not applicable.

7.1.2. Security Transport Connection Profiles

Not applicable.

7.1.3. Digital Signature Profiles

Not applicable.

7.1.4. Media Storage Security Profiles

Not applicable.

7.1.5. Attribute Confidentiality Profiles

No instances of the Encrypted Attributes Data Set are created. No Transfer Syntaxes are supported for encoding/decoding of Encrypted Attributes Data Sets.

The table below lists the attributes that are replaced during the anonymization process.

The terms used to describe the replacement value can be read as below:
- Empty: The attribute will have a value of zero length.
- Copied: Attribute has same value as original.

Table 96: Basic Application Level Confidentiality Profile Attributes

Attribute Name	Tag	VR	Replacement Value
Patient's Name	0010,0010	PN	LastName and FirstName can be changed by user
Patient ID	0010,0020	LO	Can be changed by user
Patient's Birth Date	0010,0030	DA	Empty
Referring Physician's Name	0008,0090	OB	Empty
Accession Number	0008,0050	SH	Empty
Institution Name	0008,0080	LO	Can be cleared by user
Station Name	0008,1010	SH	Empty
Institutional Department	0008,1040	LO	Empty
Operators Name	0008,1070	PN	Empty
Institution Address	0008,0080	LO	Empty
Patient's Sex	0010,0040	CS	Copied from original
Study ID	0020, 0010	SH	Copied from original
Station Name	0008,1010	SH	Always with unique character string generated by the GEMINI system
Media Storage SOP Class UID	0002,0002	UI	Automatically changed

7.1.6. Network Address Management Profiles

Not applicable.

7.1.7. Time Synchronization Profiles

Not applicable.

7.1.8. Application Configuration Management Profiles

Not applicable.

7.1.9. Audit Trail Profiles

Not applicable.

7.2. Association Level Security

Not applicable.

7.3. Application Level Security

Not applicable.

8. ANNEXES OF APPLICATION "EBW PLATFORM"

8.1. IOD Contents

8.1.1. Created SOP Instance

This section specifies each IOD created by this application.

This section specifies each IOD created (including private IODs). It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Abbreviations used in the IOD tables for the column "Presence of Module" are:

ALWAYS	The module is always present
CONDITIONAL	The module is used under specified condition
COPY	The module is copied from the source

Abbreviations used in the Module table for the column "Presence of Value" are:

ALWAYS	The attribute is always present with a value
EMPTY	The attribute is always present without any value (attribute sent zero length)
VNAP	The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
ANAP	The attribute is present under specified condition – if present then it will always have a value
ANAPCV	The attribute is present under specified condition – if present then its Value is Not Always Present (attribute sent zero length if condition applies and no value is present)
ANAPEV	The attribute is present under specified condition – if present then it will not have any value

The abbreviations used in the Module table for the column "Source" are:

AUTO	The attribute value is generated automatically
CONFIG	The attribute value source is a configurable parameter
COPY	The attribute value source is another SOP instance
FIXED	The attribute value is hard-coded in the application
IMPLICIT	The attribute value source is a user-implicit setting
MPPS	The attribute value is the same as that use for Modality Performed Procedure Step
MWL	The attribute value source is a Modality Worklist
USER	The attribute value source is explicit user input

Items in the Value and Comment columns in the following tables are filled in where appropriate to further clarify the use or meaning of each attribute beyond the definition provided by the DICOM Standard. All others are left blank for ease of use. See PS3.3 of the DICOM Standard for the complete attribute definitions.

8.1.1.1. List of created SOP Classes

Table 97: List of created SOP Classes

SOP Class Name	SOP Class UID
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59
Nuclear Medicine Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.20
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7

8.1.2. Usage of Attributes from Received IOD

The following attributes shall be present in the received IODs in order to be accepted:

For all IODs
- SOP Class UID (0008,0016)
- Study Instance UID (0020,000D)
- Series Instance UID (0020,000E)

For Image IODs
- Pixel Data (7FE0,0010) - Size may not be 0.
- Rows (0028,0010)
- Columns (0028,0011)
- Bits Allocated (0028,0100)

8.1.3. Attribute Mapping

Not applicable.

8.1.4. Coerced/Modified fields

The Import/Export Transparency of DICOM objects means preserving the attributes' values of the objects imported from an external system (remote or removable), optionally processed and then exported to an external system. Exception in GEMINI Implementation: some attributes may be coerced during the conversion from ILE.

The system complies with Level-2 requirements for Storage SCP as defined in DICOM PS 3.4 Appendix B4.1. In other words, all Type 1, Type 2, and Type 3 Attributes defined in the Information Object Definition (IOD) associated with the SOP Class, as well as any Standard Extended attributes (including Private Attributes) included in the SOP Instance, will be stored and may be accessed.

The system does not coerce any Data Elements, except those defined in the DICOM PS 3.4 Appendix B4.1. In other words, when a DICOM object is imported from another system and later exported, all the attributes values will remain unchanged. In the received IODs, the following attributes may be modified under certain conditions.

Table 98: Modified Attributes

Attribute	Tag	When Modified
Patient's Name	0010,0010	If Empty, the Patient's Name will be set to "Unknown".
Patient ID	0010,0020	If Empty, the Patient ID will be set to "Unknown".
Rows	0028,0010	Is Fixed, if rows columns does not match pixel data size.
SOP Instance UID	0008,0018	If missing, a new SOP Instance UID will be generated by the GEMINI system.

8.2. Data Dictionary of Private Attributes

Not applicable.

8.3. Coded Terminology and Templates

The GEMINI system reflects the fact that the IOD created by the workstation are always based on some source images after the viewing/processing applied and the modified images are saved. Most of the attributes or even the whole modules (Patient, General Study, etc.) are just copied from the source images.

DICOM Overlays are only created for saved Secondary Capture SOP Class images. When images with ROI, Annotations, etc. (group 50xx) are saved as DICOM Secondary Captures, the 50xx groups attributes are converted into DICOM Overlays attributes (group 60xx). In case SCP does not support group 60xx attributes - the GEMINI system has a configurable option (in LAN Config) to burn the overlays into the pixel data thus allowing any PACS to display them.

The attribute "Burned In Annotation", for saving displays with multiple images has the value "YES". The attribute "Burned In Annotation" has the value "NO" for derived objects, if saved with "hide titles" (only for secondary capture SOP Class objects).

A Time attribute contains a string of characters of the format "hhmmss.frac". In the GEMINI system, the Fractional part always has 3 decimal places.

The following table lists the modules that are always copied from the source images when the created SOP Class IOD is the same as the source SOP Class IOD.

Table 99: Modules Copied to the Derived IODs Table

Information Entity	Module Name	Presence of Module
Patient	Patient Module	COPY
	Clinical Trial Subject Module	COPY
Study	General Study Module	COPY
	Patient Study Module	COPY
	Clinical Trial Study Module	COPY
Series	General Series Module	ALWAYS CREATED
	Clinical Trial Series Module	COPY
Frame of Reference	Frame of Reference Module	COPY
Equipment	General Equipment Module	COPY

Table 100: SC Image IOD Modules Table

Information Entity	Module Name	Presence of Module
Patient	Patient Module	COPY
Study	General Study Module	COPY
	Patient Study Module	COPY
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	COPY
	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	SC Image Module	ALWAYS
	Overlay Plane	CONDITIONAL - if present in the displayed image
	Modality LUT	CONDITIONAL - if Bits Stored > 8
	VOI LUT Module	CONDITIONAL - if Bits Stored > 8
	SOP Common Module	ALWAYS

Table 101: Encapsulated PDF IOD Modules Table

Information Entity	Module Name	Presence of Module
Patient	Patient Module	COPY
	Specimen Identification	COPY
Study	General Study Module	COPY
	Patient Study Module	COPY
Series	Encapsulated Document Series	ALWAYS
Equipment	General Equipment Module	COPY
	SC Equipment Module	ALWAYS
Image	Encapsulated Document	ALWAYS
	SOP Common Module	ALWAYS

Derived Image Attributes

Image Plane Module Attributes:

- All derived images, except curved (panoramic) slab, contain the Image Position (0028,0032) and Image Orientation (0028,0037) attributes.

- All derived (including curve slab) images contain the Pixel Spacing (0028,0030) and Slice Thickness (0018,0050) attributes.

- Non-Square pixels are not supported by GEMINI viewers.

Export Converters
A number of configurable export convertors allow to modify certain IOD when sent to specific SCP.

12-to-8-bit Converter
An 12-bit SC image is converted to a 8-bit SC by applying Window/Level attributes.

Color-to-Monochrome Converter
The Color (24-bits) SC IOD is converted to a monochrome 8-bit or 12 bit SC IOD, configurable by FSE. A new UID is generated for the converted image.

PET Units Convertor
PET pixel values are converted to counts, concentration, or Standard Uptake Values (SUVs) normalized by one of several factors.

8.3.1. Context Groups

All attributes used are copied from the images created by the PET Acquisition system.

8.3.2. Template Specifications

All attributes used are copied from the images created by the PET Acquisition system.

8.3.3. Private code definitions

Not applicable.

8.4. Grayscale Image consistency

Not applicable.

8.5. Standard Extended/Specialized/Private SOPs

Not applicable.

8.6. Private Transfer Syntaxes

Supported Private Transfer Syntaxes are shown in the next Table.

Table 102: Supported Private Transfer Syntaxes

Transfer Syntax Name	Transfer Syntax UID	Comment
Private CT Transfer Syntax - Explicit VR Little Endian	1.3.46.670589.33.1.4.1	Private ELE.

9. ANNEXES OF APPLICATION "EMORY CARDIAC TOOLBOX"

9.1. IOD Contents

9.1.1. Created SOP Instance

This section specifies each IOD created by this application.

This section specifies each IOD created (including private IODs). It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Abbreviations used in the IOD tables for the column "Presence of Module" are:

ALWAYS	The module is always present
CONDITIONAL	The module is used under specified condition

Abbreviations used in the Module table for the column "Presence of Value" are:

ALWAYS	The attribute is always present with a value
EMPTY	The attribute is always present without any value (attribute sent zero length)
VNAP	The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
ANAP	The attribute is present under specified condition – if present then it will always have a value
ANAPCV	The attribute is present under specified condition – if present then its Value is Not Always Present (attribute sent zero length if condition applies and no value is present)
ANAPEV	The attribute is present under specified condition – if present then it will not have any value

The abbreviations used in the Module table for the column "Source" are:

AUTO	The attribute value is generated automatically
CONFIG	The attribute value source is a configurable parameter
COPY	The attribute value source is another SOP instance
FIXED	The attribute value is hard-coded in the application
IMPLICIT	The attribute value source is a user-implicit setting
MPPS	The attribute value is the same as that use for Modality Performed Procedure Step
MWL	The attribute value source is a Modality Worklist
USER	The attribute value source is explicit user input

Items in the Value and Comment columns in the following tables are filled in where appropriate to further clarify the use or meaning of each attribute beyond the definition provided by the DICOM Standard. All others are left blank for ease of use. See PS3.3 of the DICOM Standard for the complete attribute definitions.

9.1.1.1. List of created SOP Classes

Table 103: List of created SOP Classes

SOP Class Name	SOP Class UID
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7

9.1.1.2. Multi-frame True Color Secondary Capture Image Storage

Table 104: IOD of Created Multi-frame True Color Secondary Capture Image Storage Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	SC Multi-frame Image Module	ALWAYS
Image	SC Multi-frame Vector Module	CONDITIONAL
Image	SOP Common Module	ALWAYS

Table 105: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient ID	0010,0020	LO		ALWAYS	COPY	
Patient's Birth Date	0010,0030	DA		ANAP	COPY	
Patient's Name	0010,0010	PN		ALWAYS	COPY	
Patient's Sex	0010,0040	CS		ALWAYS	COPY	

Table 106: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		ANAP	COPY	
Referring Physician's Name	0008,0090	PN		ANAP	COPY	
Study Date	0008,0020	DA		ANAP	COPY	
Study Description	0008,1030	LO		ANAP	COPY	
Study ID	0020,0010	SH		ANAP	COPY	
Study Instance UID	0020,000D	UI		ANAP	COPY	
Study Time	0008,0030	TM		ANAP	COPY	

Table 107: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Protocol Name	0018,1030	LO		ANAP	COPY	
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Description	0008,103E	LO		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ANAP	COPY	
Series Time	0008,0031	TM		ALWAYS	AUTO	

Table 108: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	COPY	
Content Time	0008,0033	TM		ALWAYS	COPY	
Image Comments	0020,4000	LT		VNAP	AUTO	
Image Type	0008,0008	CS		VNAP	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Patient Orientation	0020,0020	CS		ANAP	COPY	

Table 109: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW OB		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Planar Configuration	0028,0006	US		VNAP		
Rows	0028,0010	US		ALWAYS	AUTO	
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	

Table 110: SC Multi-frame Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Burned In Annotation	0028,0301	CS		ANAP	AUTO	
Frame Increment Pointer	0028,0009	AT		ANAP	AUTO	
Presentation LUT Shape	2050,0020	CS		ANAP	AUTO	

Table 111: SC Multi-frame Vector Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Page Number Vector	0018,2001	IS		ANAP	AUTO	

Table 112: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	

9.1.1.3. Secondary Capture Image Storage SOP Class

Table 113: IOD of Created Secondary Capture Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Equipment	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	VOI LUT Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 114: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient ID	0010,0020	LO		ANAP	COPY	
Patient's Birth Date	0010,0030	DA		ANAP	COPY	
Patient's Name	0010,0010	PN		ANAP	COPY	
Patient's Sex	0010,0040	CS		ANAP	COPY	

Table 115: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		ANAP	COPY	
Referring Physician's Name	0008,0090	PN		ANAP	COPY	
Study Date	0008,0020	DA		ANAP	COPY	
Study Description	0008,1030	LO		ANAP	COPY	
Study ID	0020,0010	SH		ANAP	COPY	
Study Instance UID	0020,000D	UI		ANAP	COPY	
Study Time	0008,0030	TM		ANAP	COPY	

Table 116: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Protocol Name	0018,1030	LO		ANAP	COPY	
Series Date	0008,0021	DA		ANAP	COPY	
Series Description	0008,103E	LO		ANAP	COPY	
Series Instance UID	0020,000E	UI		ANAP	COPY	
Series Number	0020,0011	IS		ANAP	COPY	
Series Time	0008,0031	TM		ANAP	COPY	

Table 117: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Institution Name	0008,0080	LO		ANAP	COPY	
Manufacturer	0008,0070	LO		ANAP	COPY	

Table 118: SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Conversion Type	0008,0064	CS		ANAP	COPY	
Modality	0008,0060	CS		ANAP	COPY	
Secondary Capture Device ID	0018,1010	LO		ANAP	COPY	

Table 119: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ANAP	COPY	
Content Time	0008,0033	TM		ANAP	COPY	
Image Comments	0020,4000	LT		ANAP	COPY	
Image Type	0008,0008	CS		ANAP	COPY	
Instance Number	0020,0013	IS		ANAP	COPY	
Patient Orientation	0020,0020	CS		ANAP	COPY	

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Table 120: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Allocated	0028,0100	US		ANAP	COPY	
Bits Stored	0028,0101	US		ANAP	COPY	
Columns	0028,0011	US		ANAP	COPY	
High Bit	0028,0102	US		ANAP	COPY	
Photometric Interpretation	0028,0004	CS		ANAP	COPY	
Pixel Data	7FE0,0010	OW OB		ANAP	COPY	
Pixel Representation	0028,0103	US		ANAP	COPY	
Planar Configuration	0028,0006	US		ANAP	COPY	
Rows	0028,0010	US		ANAP	COPY	
Samples per Pixel	0028,0002	US		ANAP	COPY	

Table 121: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ALWAYS	AUTO	
Window Width	0028,1051	DS		ANAP	AUTO	

Table 122: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	

9.1.2. Usage of Attributes from Received IOD

Not applicable.

9.1.3. Attribute Mapping

Not applicable.

9.1.4. Coerced/Modified fields

Not applicable.

9.2. Data Dictionary of Private Attributes

Not applicable.

9.3. Coded Terminology and Templates

Not applicable.

9.3.1. Context Groups

Not applicable.

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9.3.2. Template Specifications

Not applicable.

9.3.3. Private code definitions

Not applicable.

9.4. Grayscale Image consistency

Not applicable.

9.5. Standard Extended/Specialized/Private SOPs

Not applicable.

9.6. Private Transfer Syntaxes

Not applicable.

10. ANNEXES OF APPLICATION "NEUROQ"

10.1. IOD Contents

10.1.1. Created SOP Instance

This section specifies each IOD created by this application.

This section specifies each IOD created (including private IODs). It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Abbreviations used in the IOD tables for the column "Presence of Module" are:

ALWAYS	The module is always present
CONDITIONAL	The module is used under specified condition

Abbreviations used in the Module table for the column "Presence of Value" are:

ALWAYS	The attribute is always present with a value
EMPTY	The attribute is always present without any value (attribute sent zero length)
VNAP	The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
ANAP	The attribute is present under specified condition – if present then it will always have a value
ANAPCV	The attribute is present under specified condition – if present then its Value is Not Always Present (attribute sent zero length if condition applies and no value is present)
ANAPEV	The attribute is present under specified condition – if present then it will not have any value

The abbreviations used in the Module table for the column "Source" are:

AUTO	The attribute value is generated automatically
CONFIG	The attribute value source is a configurable parameter
COPY	The attribute value source is another SOP instance
FIXED	The attribute value is hard-coded in the application
IMPLICIT	The attribute value source is a user-implicit setting
MPPS	The attribute value is the same as that use for Modality Performed Procedure Step
MWL	The attribute value source is a Modality Worklist
USER	The attribute value source is explicit user input

Items in the Value and Comment columns in the following tables are filled in where appropriate to further clarify the use or meaning of each attribute beyond the definition provided by the DICOM Standard. All others are left blank for ease of use. See PS3.3 of the DICOM Standard for the complete attribute definitions.

10.1.1.1. List of created SOP Classes

Table 123: List of created SOP Classes

SOP Class Name	SOP Class UID
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7

10.1.1.2. Secondary Capture Image Storage SOP Class

Table 124: IOD of Created Secondary Capture Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Equipment	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS

Table 125: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient ID	0010,0020	LO		ALWAYS	COPY	
Patient's Birth Date	0010,0030	DA		ALWAYS	COPY	
Patient's Name	0010,0010	PN		ALWAYS	COPY	
Patient's Sex	0010,0040	CS		ALWAYS	COPY	

Table 126: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		ANAP	COPY	
Referring Physician's Name	0008,0090	PN		ANAP	COPY	
Study Date	0008,0020	DA		ANAP	COPY	
Study Description	0008,1030	LO		ANAP	COPY	
Study ID	0020,0010	SH		ALWAYS	COPY	
Study Instance UID	0020,000D	UI		ALWAYS	COPY	
Study Time	0008,0030	TM		ANAP	COPY	

Table 127: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Description	0008,103E	LO		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	

Table 128: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		ANAP	COPY	

Table 129: SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Conversion Type	0008,0064	CS		ANAP	COPY	
Modality	0008,0060	CS		ANAP	COPY	
Secondary Capture Device Manufacturer	0018,1016	LO		ANAP	COPY	
Secondary Capture Device Manufacturer's Model Name	0018,1018	LO		ANAP	COPY	
Secondary Capture Device Software Version(s)	0018,1019	LO		ANAP	COPY	

Table 130: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Burned In Annotation	0028,0301	CS		ANAP	COPY	
Content Date	0008,0023	DA		ANAP	COPY	
Content Time	0008,0033	TM		ANAP	COPY	
Image Comments	0020,4000	LT		ANAP	COPY	
Image Type	0008,0008	CS		ANAP	COPY	
Instance Number	0020,0013	IS		ANAP	COPY	
Patient Orientation	0020,0020	CS		ANAP	COPY	

10.1.2. Usage of Attributes from Received IOD

Not applicable.

10.1.3. Attribute Mapping

Not applicable.

10.1.4. Coerced/Modified fields

Not applicable.

10.2. Data Dictionary of Private Attributes

Not applicable.

10.3. Coded Terminology and Templates

Not applicable.

10.3.1. Context Groups

Not applicable.

10.3.2. Template Specifications

Not applicable.

10.3.3. Private code definitions

Not applicable.

10.4. Grayscale Image consistency

Not applicable.

10.5. Standard Extended/Specialized/Private SOPs

Not applicable.

10.6. Private Transfer Syntaxes

Not applicable.

11. ANNEXES OF APPLICATION "PET CT ACQUISITION"

11.1. IOD Contents

11.1.1. Created SOP Instance

The PET Acquisition system uses Encapsulated PDF objects to store daily QC information. See section 11.1.1.3 for more information.

The system can be set up to produce NM images instead of PET images in order to support installations in environments that cannot support the PET IOD. However, the use of this feature is deprecated. For more information see section 11.1.1.6.

This section specifies each IOD created (including private IODs). It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Abbreviations used in the IOD tables for the column "Presence of Module" are:

ALWAYS	The module is always present
CONDITIONAL	The module is used under specified condition

Abbreviations used in the Module table for the column "Presence of Value" are:

ALWAYS	The attribute is always present with a value
EMPTY	The attribute is always present without any value (attribute sent zero length)
VNAP	The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
ANAP	The attribute is present under specified condition – if present then it will always have a value
ANAPCV	The attribute is present under specified condition – if present then its Value is Not Always Present (attribute sent zero length if condition applies and no value is present)
ANAPEV	The attribute is present under specified condition – if present then it will not have any value

The abbreviations used in the Module table for the column "Source" are:

AUTO	The attribute value is generated automatically
CONFIG	The attribute value source is a configurable parameter
COPY	The attribute value source is another SOP instance
FIXED	The attribute value is hard-coded in the application
IMPLICIT	The attribute value source is a user-implicit setting
MPPS	The attribute value is the same as that use for Modality Performed Procedure Step
MWL	The attribute value source is a Modality Worklist
USER	The attribute value source is explicit user input

Items in the Value and Comment columns in the following tables are filled in where appropriate to further clarify the use or meaning of each attribute beyond the definition provided by the DICOM Standard. All others are left blank for ease of use. See PS3.3 of the DICOM Standard for the complete attribute definitions.

11.1.1.1. List of created SOP Classes

Table 131: List of created SOP Classes

SOP Class Name	SOP Class UID
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1
Multi-frame Grayscale Byte SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.2
Nuclear Medicine Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.20
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7
Blending Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.4
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2

11.1.1.2. Encapsulated PDF Storage

Table 132: IOD of Created Encapsulated PDF Storage Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	Encapsulated Document Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Equipment	SC Equipment Module	ALWAYS
Encapsulated Document	Encapsulated Document Module	ALWAYS
Encapsulated Document	SOP Common Module	ALWAYS

Table 133: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient ID	0010,0020	LO		ALWAYS	AUTO	
Patient's Birth Date	0010,0030	DA		ALWAYS	AUTO	Value is based on PET acq ID number
Patient's Name	0010,0010	PN	PET^QC	ALWAYS	AUTO	
Patient's Sex	0010,0040	CS		EMPTY		

Table 134: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		EMPTY		
Referring Physician's Name	0008,0090	PN		EMPTY		
Study Date	0008,0020	DA	date of QC procedure	ALWAYS	AUTO	
Study Description	0008,1030	LO	QC for system ID	ALWAYS	AUTO	
Study ID	0020,0010	SH		ALWAYS	USER	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study Time	0008,0030	TM		ALWAYS	AUTO	

Table 135: Encapsulated Document Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	PT	ALWAYS	AUTO	
Series Description	0008,103E	LO	QC date-time-status	ALWAYS	AUTO	Describes date and time of QC procedure and pass/fail status.
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS	1	ALWAYS	AUTO	

Table 136: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO	
Station Name	0008,1010	SH		ALWAYS	AUTO	

Table 137: SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Conversion Type	0008,0064	CS	WSD	ALWAYS	AUTO	
Modality	0008,0060	CS	PT	ALWAYS	AUTO	

Table 138: Encapsulated Document Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Datetime	0008,002A	DT		EMPTY		
Burned In Annotation	0028,0301	CS	YES	ALWAYS	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Document Title	0042,0010	ST		EMPTY		
Encapsulated Document	0042,0011	OB		ALWAYS	AUTO	
Instance Number	0020,0013	IS	1	ALWAYS	AUTO	
MIME Type of Encapsulated Document	0042,0012	LO	application - PDF	ALWAYS	AUTO	
Concept Name Code Sequence	0040,A043	SQ		EMPTY		

Table 139: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA	Date of QC procedure	ALWAYS	AUTO	
Instance Creation Time	0008,0013	TM	Time of QC procedure	ALWAYS	AUTO	
Instance Number	0020,0013	IS	1	ALWAYS	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.104.1	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

11.1.1.3. Multi-frame Grayscale Byte SC Image Storage SOP Class

Table 140: IOD of Created Multi-frame Grayscale Byte SC Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Equipment	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	Multi-Frame Module	ALWAYS
Image	Frame Pointers Module	CONDITIONAL
Image	SC Image Module	ALWAYS
Image	SC Multi-frame Image Module	ALWAYS
Image	SC Multi-frame Vector Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 141: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient ID	0010,0020	LO		VNAP	MWL, USER	
Patient's Birth Date	0010,0030	DA		ALWAYS	MWL, USER	
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	
Patient's Sex	0010,0040	CS		VNAP	MWL, USER	

Table 142: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		VNAP	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	USER	
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study Description	0008,1030	LO		VNAP	MWL, USER	
Study ID	0020,0010	SH		VNAP	MWL, USER	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO, MWL	
Study Time	0008,0030	TM		ALWAYS	AUTO	

Table 143: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient Position	0018,5100	CS		ANAP	AUTO	
Protocol Name	0018,1030	LO		ANAP	AUTO	
Series Date	0008,0021	DA		ANAP	AUTO	
Series Description	0008,103E	LO		ANAP	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ANAP	AUTO	
Series Time	0008,0031	TM		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAP	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		VNAP	MWL	
Performed Procedure Step Start Time	0040,0245	TM		VNAP	MWL	
Performed Protocol Code Sequence	0040,0260	SQ		VNAP	MWL	
>Code Meaning	0008,0104	LO		VNAP	MWL	
>Code Value	0008,0100	SH		VNAP	MWL	
>Coding Scheme Designator	0008,0102	SH		VNAP	MWL	

Table 144: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Device Serial Number	0018,1000	LO		ANAP	AUTO	
Manufacturer	0008,0070	LO	May be empty, "Philips"(in daily QC images) or "GEMINI Series" (in Emission QC images)	VNAP	FIXED	
Manufacturer's Model Name	0008,1090	LO		ANAP	AUTO	
Software Version(s)	0018,1020	LO		ANAP	AUTO	

Table 145: SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Conversion Type	0008,0064	CS	WSD	ALWAYS	FIXED	
Modality	0008,0060	CS		ALWAYS	AUTO	
Secondary Capture Device ID	0018,1010	LO		ALWAYS	AUTO	
Secondary Capture Device Manufacturer	0018,1016	LO		ALWAYS	AUTO	
Secondary Capture Device Manufacturer's Model Name	0018,1018	LO		ALWAYS	AUTO	
Secondary Capture Device Software Version(s)	0018,1019	LO		ALWAYS	AUTO	

Table 146: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ALWAYS	AUTO	
Acquisition Number	0020,0012	IS		ALWAYS	AUTO	
Acquisition Time	0008,0032	TM		ALWAYS	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Image Comments	0020,4000	LT		VNAP	AUTO	
Image Type	0008,0008	CS		VNAP	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

Table 147: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Largest Image Pixel Value	0028,0107	US SS		VNAP	AUTO	
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	FIXED	
Pixel Aspect Ratio	0028,0034	IS		VNAP	AUTO	
Pixel Data	7FE0,0010	OW OB		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Samples per Pixel	0028,0002	US	1	ALWAYS	FIXED	
Smallest Image Pixel Value	0028,0106	US SS		VNAP	AUTO	

Table 148: Multi-Frame Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	IS		ALWAYS	AUTO	

Table 149: Frame Pointers Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Numbers of Interest (FOI)	0028,6020	US		ALWAYS	AUTO	Count will always match Number of Frames (0028, 0008)
Frame(s) of Interest Description	0028,6022	LO		ALWAYS	AUTO	Count will always match Number of Frames (0028, 0008)

Table 150: SC Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date of Secondary Capture	0018,1012	DA		ALWAYS	AUTO	
Time of Secondary Capture	0018,1014	TM		ALWAYS	AUTO	

Table 151: SC Multi-frame Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Burned In Annotation	0028,0301	CS		ALWAYS	AUTO	
Frame Increment Pointer	0028,0009	AT	Value 1: 0018,2001	ANAP	FIXED	Always included if # of Frames > 1

Table 152: SC Multi-frame Vector Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Page Number Vector	0018,2001	IS		ALWAYS	AUTO	

Table 153: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

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11.1.1.4. Nuclear Medicine Image Storage SOP Class

Table 154: IOD of Created Nuclear Medicine Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Series	NM/PET Patient Orientation Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	Multi-Frame Module	ALWAYS
Image	NM Image Pixel Module	ALWAYS
Image	NM Multi-frame Module	ALWAYS
Image	NM Image Module	ALWAYS
Image	NM Isotope Module	ALWAYS
Image	NM Detector Module	ALWAYS
Image	NM Tomo Acquisition Module	ALWAYS
Image	NM Reconstruction Module	ALWAYS
Image	VOI LUT Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 155: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient Comments	0010,4000	LT		VNAP	MWL, USER	
Patient ID	0010,0020	LO		VNAP	MWL, USER	
Patient's Birth Date	0010,0030	DA		VNAP	MWL, USER	
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	
Patient's Sex	0010,0040	CS		ALWAYS	MWL, USER	

Table 156: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		VNAP	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	USER	
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	USER	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO, MWL	
Study Time	0008,0030	TM		ALWAYS	AUTO	
Procedure Code Sequence	0008,1032	SQ		VNAP	MWL	
>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	
Referenced Study Sequence	0008,1110	SQ		VNAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

Table 157: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ANAP	AUTO	
Patient Position	0018,5100	CS		ANAP	AUTO	
Protocol Name	0018,1030	LO		ANAP	AUTO	
Series Date	0008,0021	DA		ANAP	AUTO	
Series Description	0008,103E	LO		ANAP	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ANAP	AUTO	
Series Time	0008,0031	TM		ANAP	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAP	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	AUTO	
Request Attributes Sequence	0040,0275	SQ		VNAP	MWL	
>Requested Procedure Description	0032,1060	LO		VNAP	MWL	
>Requested Procedure ID	0040,1001	SH		VNAP	MWL	
>Scheduled Procedure Step ID	0040,0009	SH		VNAP	MWL	
>Scheduled Protocol Code Sequence	0040,0008	SQ		VNAP	MWL	
>>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>>Code Value	0008,0100	SH		ALWAYS	MWL	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	
Comments on the Performed Procedure Step	0040,0280	ST		VNAP	MWL	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	MWL	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	MWL	
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	MWL	
>Code Meaning	0008,0104	LO		ANAP	MWL	
>Code Value	0008,0100	SH		ANAP	MWL	
>Coding Scheme Designator	0008,0102	SH		ANAP	MWL	

Table 158: NM/PET Patient Orientation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient Gantry Relationship Code Sequence	0054,0414	SQ		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
Patient Orientation Code Sequence	0054,0410	SQ		ALWAYS	AUTO	
>Patient Orientation Modifier Code Sequence	0054,0412	SQ		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	

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Table 159: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	
Position Reference Indicator	0020,1040	LO		EMPTY		

Table 160: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Device Serial Number	0018,1000	LO		VNAP	AUTO	
Institution Address	0008,0081	ST		VNAP	AUTO	
Manufacturer	0008,0070	LO		VNAP	AUTO	
Manufacturer's Model Name	0008,1090	LO		VNAP	AUTO	
Software Version(s)	0018,1020	LO		VNAP	AUTO	
Station Name	0008,1010	SH		VNAP	AUTO	

Table 161: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Datetime	0008,002A	DT		ALWAYS	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Image Comments	0020,4000	LT		VNAP	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

Table 162: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Columns	0028,0011	US		ALWAYS	AUTO	
Largest Image Pixel Value	0028,0107	US SS		VNAP	AUTO	
Pixel Data	7FE0,0010	OW OB		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Smallest Image Pixel Value	0028,0106	US SS		VNAP	AUTO	

Table 163: Multi-Frame Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	IS		ALWAYS	AUTO	

Table 164: NM Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
Pixel Spacing	0028,0030	DS		ALWAYS	AUTO	
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	

Table 165: NM Multi-frame Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Increment Pointer	0028,0009	AT		ALWAYS	AUTO	
Number of Detectors	0054,0021	US		ALWAYS	AUTO	
Number of Energy Windows	0054,0011	US		ALWAYS	AUTO	
Number of R-R Intervals	0054,0061	US		VNAP	AUTO, USER	
Number of Rotations	0054,0051	US		ALWAYS	AUTO	
Number of Slices	0054,0081	US		ALWAYS	AUTO	
Number of Time Slots	0054,0071	US		VNAP	AUTO	
R-R Interval Vector	0054,0060	US		VNAP	AUTO	
Slice Vector	0054,0080	US		ALWAYS	AUTO	
Time Slot Vector	0054,0070	US		VNAP	AUTO	

Table 166: NM Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Corrected Image	0028,0051	CS		ALWAYS	AUTO	
Counts Accumulated	0018,0070	IS		ALWAYS	AUTO	
Image Type	0008,0008	CS		ALWAYS	AUTO	

Table 167: NM Isotope Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Energy Window Information Sequence	0054,0012	SQ		ALWAYS	AUTO, USER	
>Energy Window Name	0054,0018	SH		ANAPCV	AUTO, USER	
>Energy Window Range Sequence	0054,0013	SQ		ANAPCV	AUTO, USER	
>>Energy Window Lower Limit	0054,0014	DS		ANAPCV	AUTO, USER	
>>Energy Window Upper Limit	0054,0015	DS		ANAPCV	AUTO, USER	
Radiopharmaceutical Information Sequence	0054,0016	SQ		ALWAYS	AUTO, USER	
>Radionuclide Total Dose	0018,1074	DS		ALWAYS	AUTO	
>Radiopharmaceutical	0018,0031	LO		VNAP	AUTO, USER	
>Radiopharmaceutical Start Time	0018,1072	TM		ALWAYS	AUTO	
>Radionuclide Code Sequence	0054,0300	SQ		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO, USER	
>>Code Value	0008,0100	SH		ALWAYS	AUTO, USER	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO, USER	
>Radiopharmaceutical Code Sequence	0054,0304	SQ		VNAP	AUTO, USER	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO, USER	
>>Code Value	0008,0100	SH		ALWAYS	AUTO, USER	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO, USER	

Table 168: NM Detector Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Detector Information Sequence	0054,0022	SQ		ALWAYS	AUTO	
>Collimator Type	0018,1181	CS	NONE	ALWAYS	AUTO	
>Field of View Dimension(s)	0018,1149	IS		ALWAYS	AUTO	
>Field of View Shape	0018,1147	CS	CYLINDRICAL RING	ALWAYS	AUTO	
>Focal Distance	0018,1182	IS		VNAP	AUTO	
>Image Orientation (Patient)	0020,0037	DS		ALWAYS	AUTO	
>Image Position (Patient)	0020,0032	DS		ALWAYS	AUTO	
>View Code Sequence	0054,0220	SQ		VNAP	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	

Table 169: NM Tomo Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rotation Information Sequence	0054,0052	SQ		VNAP	AUTO	
>Actual Frame Duration	0018,1242	IS		ALWAYS	AUTO	
>Angular Step	0018,1144	DS		ALWAYS	AUTO	
>Number of Frames in Rotation	0054,0053	US		ALWAYS	AUTO	
>Rotation Direction	0018,1140	CS		ALWAYS	AUTO	
>Scan Arc	0018,1143	DS		ALWAYS	AUTO	
>Start Angle	0054,0200	DS		ALWAYS	AUTO	

Table 170: NM Reconstruction Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Slice Thickness	0018,0050	DS		ALWAYS	AUTO	
Spacing Between Slices	0018,0088	DS		ALWAYS	AUTO	

Table 171: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ALWAYS	AUTO	
Window Width	0028,1051	DS		ALWAYS	AUTO	

Table 172: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Specific Character Set	0008,0005	CS		ANAP	AUTO	

11.1.1.5. Positron Emission Tomography Image Storage SOP Class

Table 173: IOD of Created Positron Emission Tomography Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Study	Patient Study Module	ALWAYS
Series	General Series Module	ALWAYS
Series	PET Series Module	ALWAYS
Series	PET Isotope Module	ALWAYS
Series	PET Multi-gated Acquisition Module	CONDITIONAL
Series	NM/PET Patient Orientation Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Plane Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	Acquisition Context Module	CONDITIONAL
Image	PET Image Module	ALWAYS
Image	VOI LUT Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 174: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Ethnic Group	0010,2160	SH		VNAP	MWL	
Other Patient IDs	0010,1000	LO		VNAP	MWL	
Patient Comments	0010,4000	LT		VNAP	MWL, USER	
Patient ID	0010,0020	LO		ALWAYS	MWL, USER	
Patient's Birth Date	0010,0030	DA		ALWAYS	MWL, USER	
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	
Patient's Sex	0010,0040	CS		ALWAYS	MWL, USER	

Table 175: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		VNAP	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	USER	
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study Description	0008,1030	LO		ANAP	USER	
Study ID	0020,0010	SH		ALWAYS	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO, MWL	
Study Time	0008,0030	TM		ALWAYS	AUTO	
Procedure Code Sequence	0008,1032	SQ		VNAP	MWL	
>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	

Table 176: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Additional Patient History	0010,21B0	LT		VNAP	MWL	
Patient's Size	0010,1020	DS		ANAPCV	USER	
Patient's Weight	0010,1030	DS		VNAP	USER	

Table 177: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	PT	ALWAYS	AUTO	
Operators' Name	0008,1070	PN		ALWAYS	USER	
Patient Position	0018,5100	CS		ALWAYS	USER	
Protocol Name	0018,1030	LO		ALWAYS	AUTO	
Series Description	0008,103E	LO		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		VNAP	MWL	
>Referenced SOP Class UID	0008,1150	UI		VNAP	MWL	
>Referenced SOP Instance UID	0008,1155	UI		VNAP	MWL	
Related Series Sequence	0008,1250	SQ		ANAP	AUTO	
>Series Instance UID	0020,000E	UI		ANAP	AUTO	
>Study Instance UID	0020,000D	UI		ANAP	AUTO	
>Purpose of Reference Code Sequence	0040,A170	SQ		ANAP	AUTO	
>>Code Meaning	0008,0104	LO	For Attenuation Correction	ANAP	AUTO	
>>Code Value	0008,0100	SH	122403	ANAP	AUTO	
>>Coding Scheme Designator	0008,0102	SH	DCM	ANAP	AUTO	
>>Coding Scheme Version	0008,0103	SH		ANAP	AUTO	
>>Context Group Extension Creator UID	0008,010D	UI		ANAP	AUTO	
>>Context Group Extension Flag	0008,010B	CS		ANAP	AUTO	
>>Context Group Local Version	0008,0107	DT		ANAP	AUTO	
>>Context Group Version	0008,0106	DT		ANAP	AUTO	
>>Context Identifier	0008,010F	CS		ANAP	AUTO	
>>Mapping Resource	0008,0105	CS		ANAP	AUTO	
Request Attributes Sequence	0040,0275	SQ		VNAP	MWL	
>Requested Procedure ID	0040,1001	SH		VNAP	MWL	
>Scheduled Procedure Step Description	0040,0007	LO		VNAP	MWL	
>Scheduled Procedure Step ID	0040,0009	SH		VNAP	MWL	
>Scheduled Protocol Code Sequence	0040,0008	SQ		VNAP	MWL	
>>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>>Code Value	0008,0100	SH		ALWAYS	MWL	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	
Comments on the Performed Procedure Step	0040,0280	ST		VNAP	MWL	
Performed Procedure Step Description	0040,0254	LO		VNAP	AUTO	
Performed Procedure Step ID	0040,0253	SH		VNAP	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		VNAP	AUTO	
Performed Procedure Step Start Time	0040,0245	TM		VNAP	AUTO	
Performed Protocol Code Sequence	0040,0260	SQ		VNAP	AUTO	

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Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	

Table 178: PET Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Attenuation Correction Method	0054,1101	LO		ALWAYS	AUTO	
Collimator Type	0018,1181	CS	NONE	ALWAYS	AUTO	
Convolution Kernel	0018,1210	SH		ALWAYS	AUTO	
Corrected Image	0028,0051	CS		ALWAYS	AUTO	
Counts Source	0054,1002	CS		ALWAYS	AUTO	
Decay Correction	0054,1102	CS	ADMIN, NONE, START	ALWAYS	AUTO	When value is START, and multiple start times exist in the Series, all Images in the Series are corrected to the earliest start time.
Field of View Dimension(s)	0018,1149	IS		ALWAYS	AUTO	
Field of View Shape	0018,1147	CS	CYLINDRICAL RING	ALWAYS	AUTO	
Number of R-R Intervals	0054,0061	US		ANAP	AUTO	
Number of Slices	0054,0081	US		ALWAYS	AUTO	
Number of Time Slices	0054,0101	US		VNAP	AUTO	
Number of Time Slots	0054,0071	US		ANAP	AUTO	
Randoms Correction Method	0054,1100	CS		ALWAYS	AUTO	
Reconstruction Diameter	0018,1100	DS		ALWAYS	AUTO	
Reconstruction Method	0054,1103	LO		ALWAYS	AUTO	
Scatter Correction Method	0054,1105	LO		ALWAYS	AUTO	
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Series Type	0054,1000	CS		ALWAYS	AUTO	
Type of Detector Motion	0054,0202	CS	NONE	ALWAYS	AUTO	
Units	0054,1001	CS	BQML, CNTS	ALWAYS	CONFIG	

Table 179: PET Isotope Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Radiopharmaceutical Information Sequence	0054,0016	SQ		ALWAYS	AUTO	
>Radionuclide Half Life	0018,1075	DS		ALWAYS	AUTO	
>Radionuclide Positron Fraction	0018,1076	DS		ANAP	AUTO	
>Radionuclide Total Dose	0018,1074	DS		ALWAYS	AUTO	
>Radiopharmaceutical	0018,0031	LO		ALWAYS	AUTO, MWL	
>Radiopharmaceutical Route	0018,1070	LO		ALWAYS	AUTO	
>Radiopharmaceutical Start Datetime	0018,1078	DT		ALWAYS	AUTO, USER	
>Radiopharmaceutical Start Time	0018,1072	TM		ALWAYS	AUTO	
>Administration Route Code Sequence	0054,0302	SQ		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Radionuclide Code Sequence	0054,0300	SQ		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Radiopharmaceutical Code Sequence	0054,0304	SQ		VNAP	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	

Table 180: PET Multi-gated Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Beat Rejection Flag	0018,1080	CS		ANAP	AUTO	
Cardiac Framing Type	0018,1064	LO		ANAP	AUTO	
Trigger Source or Type	0018,1061	LO	EKG	ANAP	AUTO	

Table 181: NM/PET Patient Orientation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient Gantry Relationship Code Sequence	0054,0414	SQ		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
Patient Orientation Code Sequence	0054,0410	SQ		ALWAYS	AUTO	
>Patient Orientation Modifier Code Sequence	0054,0412	SQ		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	

Table 182: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	
Position Reference Indicator	0020,1040	LO		EMPTY		

Table 183: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	
Institution Name	0008,0080	LO		ALWAYS	CONFIG	
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO	
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	
Station Name	0008,1010	SH		ALWAYS	AUTO	

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Table 184: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Datetime	0008,002A	DT		ALWAYS	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Image Comments	0020,4000	LT		VNAP	AUTO	
Image Type	0008,0008	CS		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

Table 185: Image Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Orientation (Patient)	0020,0037	DS		ALWAYS	AUTO	
Image Position (Patient)	0020,0032	DS		ALWAYS	AUTO	
Pixel Spacing	0028,0030	DS		ALWAYS	AUTO	
Slice Location	0020,1041	DS		ALWAYS	AUTO	
Slice Thickness	0018,0050	DS		ALWAYS	AUTO	

Table 186: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Columns	0028,0011	US		ALWAYS	AUTO	
Largest Image Pixel Value	0028,0107	US SS		ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW OB		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Smallest Image Pixel Value	0028,0106	US SS		ALWAYS	AUTO	

Table 187: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	SQ		ALWAYS	AUTO	
>Concept Code Sequence	0040,A168	SQ		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Concept Name Code Sequence	0040,A043	SQ		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO	Patient State	ALWAYS	FIXED	
>>Code Value	0008,0100	SH	109054	ALWAYS	FIXED	
>>Coding Scheme Designator	0008,0102	SH	DCM	ALWAYS	FIXED	

Table 188: PET Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ALWAYS	AUTO	
Acquisition Time	0008,0032	TM		ALWAYS	AUTO	
Actual Frame Duration	0018,1242	IS		ALWAYS	AUTO	
Bits Allocated	0028,0100	US	16	ALWAYS	AUTO	
Bits Stored	0028,0101	US	16	ALWAYS	AUTO	
Decay Factor	0054,1321	DS		ALWAYS	AUTO	
Frame Reference Time	0054,1300	DS		ALWAYS	AUTO	
Frame Time	0018,1063	DS		VNAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
High Bit	0028,0102	US	15	ALWAYS	AUTO	
High R-R Value	0018,1082	IS		VNAP	AUTO	
Image Index	0054,1330	US		ALWAYS	AUTO	
Intervals Acquired	0018,1083	IS		VNAP	AUTO	
Intervals Rejected	0018,1084	IS		VNAP	AUTO	
Low R-R Value	0018,1081	IS		VNAP	AUTO	
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO	
Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	
Rescale Slope	0028,1053	DS		ALWAYS	AUTO	
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO	
Trigger Time	0018,1060	DS		ANAP	AUTO	

Table 189: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ALWAYS	AUTO	
Window Width	0028,1051	DS		ALWAYS	AUTO	

Table 190: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		VNAP	AUTO	
Instance Creation Time	0008,0013	TM		VNAP	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	

11.1.1.6. Secondary Capture Image Storage SOP Class

Table 191: IOD of Created Secondary Capture Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Study	Patient Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Equipment	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	SC Image Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 192: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Ethnic Group	0010,2160	SH		VNAP	MWL	
Other Patient IDs	0010,1000	LO		VNAP	MWL	
Patient ID	0010,0020	LO		ALWAYS	MWL, USER	
Patient's Birth Date	0010,0030	DA		ALWAYS	MWL, USER	
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	
Patient's Sex	0010,0040	CS		VNAP	MWL, USER	

Table 193: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		VNAP	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	USER	
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study Description	0008,1030	LO		ALWAYS	USER	
Study ID	0020,0010	SH		ALWAYS	USER	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO, MWL	
Study Time	0008,0030	TM		ALWAYS	AUTO	
Procedure Code Sequence	0008,1032	SQ		VNAP	MWL	
>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	

Table 194: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Additional Patient History	0010,21B0	LT		VNAP	MWL	
Patient's Weight	0010,1030	DS		VNAP	USER	

Table 195: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient Position	0018,5100	CS		ALWAYS	AUTO	
Protocol Name	0018,1030	LO		ALWAYS	AUTO	
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Description	0008,103E	LO		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Request Attributes Sequence	0040,0275	SQ		VNAP	MWL	
>Requested Procedure ID	0040,1001	SH		VNAP	MWL	
>Scheduled Procedure Step Description	0040,0007	LO		VNAP	MWL	
>Scheduled Procedure Step ID	0040,0009	SH		VNAP	MWL	
>Scheduled Protocol Code Sequence	0040,0008	SQ		VNAP	MWL	
>>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>>Code Value	0008,0100	SH		ALWAYS	MWL	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	

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Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Comments on the Performed Procedure Step	0040,0280	ST		VNAP	MWL	
Performed Procedure Step Description	0040,0254	LO		VNAP	MWL	
Performed Procedure Step ID	0040,0253	SH		VNAP	MWL	
Performed Procedure Step Start Date	0040,0244	DA		VNAP	MWL	
Performed Procedure Step Start Time	0040,0245	TM		VNAP	MWL	
Performed Protocol Code Sequence	0040,0260	SQ		VNAP	MWL	
>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	

Table 196: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	
Institution Name	0008,0080	LO		ALWAYS	AUTO	
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO	
Manufacturer's Model Name	0008,1090	LO		VNAP	AUTO	
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	
Station Name	0008,1010	SH		ALWAYS	AUTO	

Table 197: SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Conversion Type	0008,0064	CS	WSD	ALWAYS	FIXED	
Modality	0008,0060	CS		ALWAYS	AUTO	
Secondary Capture Device ID	0018,1010	LO		ALWAYS	AUTO	
Secondary Capture Device Manufacturer	0018,1016	LO		ALWAYS	AUTO	
Secondary Capture Device Manufacturer's Model Name	0018,1018	LO		ALWAYS	AUTO	
Secondary Capture Device Software Version(s)	0018,1019	LO		ALWAYS	AUTO	

Table 198: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ALWAYS	AUTO	
Acquisition Number	0020,0012	IS		ALWAYS	AUTO	
Acquisition Time	0008,0032	TM		ALWAYS	AUTO	
Burned In Annotation	0028,0301	CS		VNAP	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Image Comments	0020,4000	LT		VNAP	AUTO	
Image Type	0008,0008	CS		VNAP	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

Table 199: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Largest Image Pixel Value	0028,0107	US SS		VNAP	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
Pixel Aspect Ratio	0028,0034	IS		VNAP	AUTO	
Pixel Data	7FE0,0010	OW OB		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Planar Configuration	0028,0006	US		VNAP	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
Smallest Image Pixel Value	0028,0106	US SS		VNAP	AUTO	

Table 200: SC Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date of Secondary Capture	0018,1012	DA		ALWAYS	AUTO	
Time of Secondary Capture	0018,1014	TM		ALWAYS	AUTO	

Table 201: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		VNAP	AUTO	
Instance Creation Time	0008,0013	TM		VNAP	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

11.1.1.7. Blending Softcopy Presentation State Storage SOP Class

Table 202: IOD of Created Blending Softcopy Presentation State Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Study	Patient Study Module	ALWAYS
Series	General Series Module	ALWAYS
Series	Presentation Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Presentation State	Presentation State Identification Module	ALWAYS
Presentation State	Presentation State Blending Module	ALWAYS
Presentation State	Palette Color Lookup Module	ALWAYS
Presentation State	Displayed Area Module	ALWAYS
Presentation State	ICC Profile Module	ALWAYS
Presentation State	SOP Common Module	ALWAYS

Table 203: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Ethnic Group	0010,2160	SH		EMPTY		
Other Patient IDs	0010,1000	LO		EMPTY		
Patient Comments	0010,4000	LT		EMPTY		
Patient ID	0010,0020	LO		ALWAYS	MWL, USER	
Patient's Birth Date	0010,0030	DA		ALWAYS	MWL, USER	
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	
Patient's Sex	0010,0040	CS		ALWAYS	MWL, USER	

Table 204: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		VNAP	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	USER	
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study Description	0008,1030	LO		ALWAYS	USER	
Study ID	0020,0010	SH		ALWAYS	USER	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO, MWL	
Study Time	0008,0030	TM		ALWAYS	AUTO	
Procedure Code Sequence	0008,1032	SQ		VNAP	MWL	
>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	

Table 205: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Additional Patient History	0010,21B0	LT		VNAP	MWL	
Patient's Weight	0010,1030	DS		VNAP	USER	

Table 206: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient Position	0018,5100	CS		ALWAYS	AUTO	
Protocol Name	0018,1030	LO		ALWAYS	AUTO	
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Description	0008,103E	LO		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Request Attributes Sequence	0040,0275	SQ		VNAP	MWL	
>Requested Procedure Description	0032,1060	LO		VNAP	MWL	
>Requested Procedure ID	0040,1001	SH		VNAP	MWL	
>Scheduled Procedure Step ID	0040,0009	SH		VNAP	MWL	
>Scheduled Protocol Code Sequence	0040,0008	SQ		VNAP	MWL	
>>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>>Code Value	0008,0100	SH		ALWAYS	MWL	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Comments on the Performed Procedure Step	0040,0280	ST		VNAP	MWL	
Performed Procedure Step Description	0040,0254	LO		VNAP	MWL	
Performed Procedure Step ID	0040,0253	SH		VNAP	MWL	
Performed Procedure Step Start Date	0040,0244	DA		VNAP	MWL	
Performed Procedure Step Start Time	0040,0245	TM		VNAP	MWL	
Performed Protocol Code Sequence	0040,0260	SQ		VNAP	MWL	
>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	

Table 207: Presentation Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	PR	ALWAYS	FIXED	

Table 208: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	
Institution Name	0008,0080	LO		ALWAYS	AUTO	
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO	
Manufacturer's Model Name	0008,1090	LO		VNAP	AUTO	
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	
Station Name	0008,1010	SH		ALWAYS	AUTO	

Table 209: Presentation State Identification Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Presentation Creation Date	0070,0082	DA		ALWAYS	AUTO	
Presentation Creation Time	0070,0083	TM		ALWAYS	AUTO	
Content Creator's Name	0070,0084	PN		ALWAYS	AUTO	
Content Description	0070,0081	LO		ALWAYS	AUTO	
Content Label	0070,0080	CS		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

Table 210: Presentation State Blending Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Blending Sequence	0070,0402	SQ		ALWAYS	AUTO	
>Blending Position	0070,0405	CS	SUPERIMPOSED, UNDERLYING	ALWAYS	AUTO	
>Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
>Softcopy VOI LUT Sequence	0028,3110	SQ		ALWAYS	AUTO	
>>Referenced Image Sequence	0008,1140	SQ		ALWAYS	AUTO	
>>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
>>VOI LUT Sequence	0028,3010	SQ		ALWAYS	AUTO	
>>>LUT Data	0028,3006	US OW		ALWAYS	AUTO	
>>>LUT Descriptor	0028,3002	US SS		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	
>Rescale Slope	0028,1053	DS		ALWAYS	AUTO	
>Rescale Type	0028,1054	LO	US	ALWAYS	AUTO	

Table 211: Palette Color Lookup Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Blue Palette Color Lookup Table Data	0028,1203	OW		ALWAYS	AUTO	
Blue Palette Color Lookup Table Descriptor	0028,1103	US SS		ALWAYS	AUTO	
Green Palette Color Lookup Table Data	0028,1202	OW		ALWAYS	AUTO	
Green Palette Color Lookup Table Descriptor	0028,1102	US SS		ALWAYS	AUTO	
Red Palette Color Lookup Table Data	0028,1201	OW		ALWAYS	AUTO	
Red Palette Color Lookup Table Descriptor	0028,1101	US SS		ALWAYS	AUTO	

Table 212: Displayed Area Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Displayed Area Selection Sequence	0070,005A	SQ		ALWAYS	AUTO	
>Displayed Area Bottom Right Hand Corner	0070,0053	SL		ALWAYS	AUTO	
>Displayed Area Top Left Hand Corner	0070,0052	SL		ALWAYS	AUTO	
>Presentation Pixel Aspect Ratio	0070,0102	IS	Value 1: 1	ALWAYS	FIXED	
>Presentation Size Mode	0070,0100	CS	SCALE TO FIT	ALWAYS	FIXED	
>Referenced Image Sequence	0008,1140	SQ		ALWAYS	AUTO	
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

Table 213: ICC Profile Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
ICC Profile	0028,2000	OB		ALWAYS	AUTO	

Table 214: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		VNAP	AUTO	
Instance Creation Time	0008,0013	TM		VNAP	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

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11.1.1.8. Multi-frame True Color Secondary Capture Image Storage

Table 215: IOD of Created Multi-frame True Color Secondary Capture Image Storage Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Equipment	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	Frame Pointers Module	CONDITIONAL
Image	Multi-frame Functional Groups Module (True Color Sc Image)	ALWAYS
Image	SC Image Module	ALWAYS
Image	SC Multi-frame Image Module	ALWAYS
Image	SC Multi-frame Vector Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 216: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient ID	0010,0020	LO		VNAP	MWL, USER	
Patient's Birth Date	0010,0030	DA		ALWAYS	MWL, USER	
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	
Patient's Sex	0010,0040	CS		VNAP	MWL, USER	

Table 217: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		VNAP	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	USER	
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study Description	0008,1030	LO		ANAP	USER	
Study ID	0020,0010	SH		ANAP	USER	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO, MWL	
Study Time	0008,0030	TM		ALWAYS	AUTO	

Table 218: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient Position	0018,5100	CS		ALWAYS	AUTO	
Protocol Name	0018,1030	LO		ALWAYS	AUTO	
Series Date	0008,0021	DA		ANAP	AUTO	
Series Description	0008,103E	LO		ANAP	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ANAP	AUTO	
Series Time	0008,0031	TM		ANAP	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Referenced SOP Instance UID	0008,1155	UI		ANAP	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		VNAP	MWL	
Performed Procedure Step Start Time	0040,0245	TM		VNAP	MWL	
Performed Protocol Code Sequence	0040,0260	SQ		VNAP	MWL	
>Code Meaning	0008,0104	LO		VNAP	MWL	
>Code Value	0008,0100	SH		VNAP	MWL	
>Coding Scheme Designator	0008,0102	SH		VNAP	MWL	

Table 219: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Device Serial Number	0018,1000	LO		ANAP	AUTO	
Manufacturer	0008,0070	LO	Philips Medical Systems Inc	ALWAYS	FIXED	
Manufacturer's Model Name	0008,1090	LO		VNAP	AUTO	
Software Version(s)	0018,1020	LO		ANAP	AUTO	

Table 220: SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Conversion Type	0008,0064	CS	WSD	ALWAYS	FIXED	
Modality	0008,0060	CS		ALWAYS	AUTO	
Secondary Capture Device ID	0018,1010	LO		ALWAYS	AUTO	
Secondary Capture Device Manufacturer	0018,1016	LO		ALWAYS	AUTO	
Secondary Capture Device Manufacturer's Model Name	0018,1018	LO		ALWAYS	AUTO	
Secondary Capture Device Software Version(s)	0018,1019	LO		ALWAYS	AUTO	

Table 221: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ALWAYS	AUTO	
Acquisition Number	0020,0012	IS		ALWAYS	AUTO	
Acquisition Time	0008,0032	TM		ALWAYS	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Image Comments	0020,4000	LT		VNAP	AUTO	
Image Type	0008,0008	CS		VNAP	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

Table 222: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Largest Image Pixel Value	0028,0107	US SS		VNAP	AUTO	
Photometric Interpretation	0028,0004	CS	RGB	ALWAYS	FIXED	
Pixel Aspect Ratio	0028,0034	IS		VNAP	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Pixel Data	7FE0,0010	OW OB		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Planar Configuration	0028,0006	US		VNAP	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Samples per Pixel	0028,0002	US	3	ALWAYS	FIXED	
Smallest Image Pixel Value	0028,0106	US SS		VNAP	AUTO	

Table 223: Frame Pointers Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Numbers of Interest (FOI)	0028,6020	US		ALWAYS	AUTO	Count will always match Number of Frames (0028, 0008)
Frame(s) of Interest Description	0028,6022	LO		ALWAYS	AUTO	Count will always match Number of Frames (0028, 0008)

Table 224: Multi-frame Functional Groups Module (True Color Sc Image)

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	IS		ALWAYS	AUTO	

Table 225: SC Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date of Secondary Capture	0018,1012	DA		ALWAYS	AUTO	
Time of Secondary Capture	0018,1014	TM		ALWAYS	AUTO	

Table 226: SC Multi-frame Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Burned In Annotation	0028,0301	CS		ALWAYS	AUTO	
Frame Increment Pointer	0028,0009	AT	Value 1: 0018,2001	ANAP	FIXED	Always included if # of Frames > 1

Table 227: SC Multi-frame Vector Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Page Number Vector	0018,2001	IS		ALWAYS	AUTO	

Table 228: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

11.1.1.9. Raw Data Storage SOP Class

Table 229: IOD of Created Raw Data Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Raw Data	Acquisition Context Module	ALWAYS
Raw Data	Raw Data Module	ALWAYS
Raw Data	SOP Common Module	ALWAYS

Table 230: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient ID	0010,0020	LO		ALWAYS	MWL, USER	
Patient's Birth Date	0010,0030	DA		ALWAYS	MWL, USER	
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	
Patient's Sex	0010,0040	CS		ALWAYS	MWL, USER	

Table 231: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		VNAP	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	MWL, USER	
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study ID	0020,0010	SH		ALWAYS	AUTO, MWL	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO, MWL	
Study Time	0008,0030	TM		ALWAYS	AUTO	
Referenced Study Sequence	0008,1110	SQ		ANAP	AUTO	

Table 232: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Laterality	0020,0060	CS		ANAP	AUTO	
Modality	0008,0060	CS	PT	ALWAYS	AUTO	
Patient Position	0018,5100	CS		ALWAYS	USER	
Protocol Name	0018,1030	LO		ALWAYS	AUTO	
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Description	0008,103E	LO		ALWAYS	AUTO, USER	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		VNAP	AUTO	
Request Attributes Sequence	0040,0275	SQ		ANAP	MWL	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Requested Procedure ID	0040,1001	SH		ANAP	MWL	
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	MWL	
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	MWL	
>Scheduled Protocol Code Sequence	0040,0008	SQ		ANAP	MWL	
Performed Procedure Step Description	0040,0254	LO		VNAP	AUTO, MWL	
Performed Procedure Step ID	0040,0253	SH		ALWAYS	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		ALWAYS	AUTO	
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	AUTO	

Table 233: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	
Position Reference Indicator	0020,1040	LO		EMPTY		

Table 234: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	
Institution Name	0008,0080	LO		ALWAYS	CONFIG	
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO	
Manufacturer's Model Name	0008,1090	LO		VNAP	AUTO	
Station Name	0008,1010	SH		ALWAYS	CONFIG	Server hostname

Table 235: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	SQ		ANAP	AUTO	

Table 236: Raw Data Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Creator-Version UID	0008,9123	UI	1.3.46.670589.28.2.99.9.3	ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

Table 237: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.66	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	AUTO	

11.1.1.10. CT Image Storage SOP Class

Table 238: IOD of Created CT Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Study	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Plane Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	Contrast/Bolus Module	CONDITIONAL
Image	CT Image Module	ALWAYS
Image	VOI LUT Module	CONDITIONAL
Image	SOP Common Module	ALWAYS

Table 239: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Ethnic Group	0010,2160	SH		ANAP	MWL	
Other Patient Names	0010,1001	PN		ANAP	MWL	
Patient Comments	0010,4000	LT		ANAP	MWL	
Patient ID	0010,0020	LO		ALWAYS	MWL, USER	
Patient's Birth Date	0010,0030	DA		ALWAYS	MWL, USER	
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	
Patient's Sex	0010,0040	CS		ALWAYS	MWL, USER	

Table 240: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		VNAP	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	MWL, USER	
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study Description	0008,1030	LO		ALWAYS	MWL, USER	
Study ID	0020,0010	SH		ALWAYS	AUTO, MWL	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO, MWL	
Study Time	0008,0030	TM		ALWAYS	AUTO	
Procedure Code Sequence	0008,1032	SQ		VNAP	MWL	Value is acquired from the (0032,1064) sequence in the MWL
>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	
Referenced Study Sequence	0008,1110	SQ		ANAP	MWL	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	MWL	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	MWL	

Table 241: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Additional Patient History	0010,21B0	LT		ANAP	MWL	
Patient's Age	0010,1010	AS		ANAP	AUTO	Value is generated from patient's birth date
Patient's Size	0010,1020	DS		ANAP	MWL, USER	
Patient's Weight	0010,1030	DS		VNAP	MWL, USER	

Table 242: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	CT	ALWAYS	AUTO	
Patient Position	0018,5100	CS		ALWAYS	AUTO	
Protocol Name	0018,1030	LO		ALWAYS	AUTO	
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Description	0008,103E	LO		ALWAYS	USER	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Request Attributes Sequence	0040,0275	SQ		VNAP	MWL	
>Requested Procedure ID	0040,1001	SH		VNAP	MWL	
>Scheduled Procedure Step Description	0040,0007	LO		VNAP	MWL	
>Scheduled Procedure Step ID	0040,0009	SH		VNAP	MWL	
>Scheduled Protocol Code Sequence	0040,0008	SQ		VNAP	MWL	
>>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>>Code Value	0008,0100	SH		ALWAYS	MWL	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	
Comments on the Performed Procedure Step	0040,0280	ST		VNAP	MWL	
Performed Procedure Step Description	0040,0254	LO		VNAP	MWL	
Performed Procedure Step ID	0040,0253	SH		VNAP	MWL	
Performed Procedure Step Start Date	0040,0244	DA		VNAP	MWL	
Performed Procedure Step Start Time	0040,0245	TM		VNAP	MWL	
Performed Protocol Code Sequence	0040,0260	SQ		VNAP	MWL	
>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	

Table 243: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	
Position Reference Indicator	0020,1040	LO		VNAP	AUTO	

Table 244: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	
Institution Name	0008,0080	LO		ALWAYS	AUTO	
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO	
Manufacturer's Model Name	0008,1090	LO		VNAP	AUTO	
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	
Station Name	0008,1010	SH		ALWAYS	AUTO	

Table 245: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ANAP	AUTO	
Acquisition Time	0008,0032	TM		ANAP	AUTO	
Content Date	0008,0023	DA		ANAP	AUTO	
Content Time	0008,0033	TM		ANAP	AUTO	
Image Comments	0020,4000	LT		ANAP	USER	
Instance Number	0020,0013	IS		VNAP	AUTO	

Table 246: Image Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Orientation (Patient)	0020,0037	DS		ALWAYS	AUTO	
Image Position (Patient)	0020,0032	DS		ALWAYS	AUTO	
Pixel Spacing	0028,0030	DS		ALWAYS	AUTO	
Slice Location	0020,1041	DS		ALWAYS	AUTO	
Slice Thickness	0018,0050	DS		ALWAYS	AUTO	

Table 247: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Columns	0028,0011	US		ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW OB		ALWAYS	AUTO	
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	

Table 248: Contrast/Bolus Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast Flow Rate	0018,1046	DS		ANAP	AUTO	
Contrast/Bolus Agent	0018,0010	LO		VNAP	AUTO	
Contrast/Bolus Ingredient Concentration	0018,1049	DS		ANAP	AUTO	
Contrast/Bolus Route	0018,1040	LO		ANAP	AUTO	
Contrast/Bolus Volume	0018,1041	DS		ANAP	AUTO	
Contrast/Bolus Administration Route Sequence	0018,0014	SQ		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	

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Table 249: CT Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Number	0020,0012	IS		VNAP	AUTO	
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
Convolution Kernel	0018,1210	SH		ANAP	AUTO	
Data Collection Diameter	0018,0090	DS		ANAP	AUTO	
Exposure	0018,1152	IS		ANAP	AUTO	
Exposure Time	0018,1150	IS		ANAP	AUTO	
Filter Type	0018,1160	SH		ANAP	AUTO	
Gantry/Detector Tilt	0018,1120	DS		ANAP	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Image Type	0008,0008	CS		ALWAYS	AUTO	
KVP	0018,0060	DS		VNAP	AUTO	
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO	
Reconstruction Diameter	0018,1100	DS		ANAP	AUTO	
Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	
Rescale Slope	0028,1053	DS		ALWAYS	AUTO	
Rotation Direction	0018,1140	CS		ANAP	AUTO	
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
Scan Options	0018,0022	CS		ANAP	AUTO	
Table Height	0018,1130	DS		ANAP	AUTO	
X-ray Tube Current	0018,1151	IS		ANAP	AUTO	

Table 250: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ANAP	AUTO	
Window Width	0028,1051	DS		ANAP	AUTO	

Table 251: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.2	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Specific Character Set	0008,0005	CS		ANAP	AUTO, MWL	

11.1.2. Usage of Attributes from Received IOD

The local database, remote query, and directory browsers make use of the conventional identification attributes to distinguish patients, studies, series, and instances. In particular, the system requires that the patient name (first and last name only), patient ID, birth date and sex all match in order to be considered the same patient.

11.1.3. Attribute Mapping

Table 252: Attribute Mapping during Modality Workflow

Name	Worklist Tag	MPPS		CT Image IOD Tag	PT Image IOD Tag
		Create Tag	Set Tag		
Accession Number	0008,0050	0008,0050	-	0008,0050	0008,0050
Referring Physician's Name	0008,0090	-	-	0008,0090	0008,0090
Referenced Study Sequence	0008,1110	0008,1110	-	0008,1110	0008,1110
Referenced Patient Sequence	0008,1120	0008,1120	-	-	-
Referenced Image Sequence	-	-	0008,1140	-	-
> Referenced SOP Class UID SOP Class UID	-	-	0008,1150	0008,0016	0008,0016
> Referenced SOP Instance UID SOP Instance UID	-	-	0008,1155	0008,0018	0008,0018
Patient's Name	0010,0010	0010,0010	-	0010,0010	0010,0010
Patient ID	0010,0020	0010,0020	-	0010,0020	0010,0020
Patient's Birth Date	0010,0030	0010,0030	-	0010,0030	0010,0030
Patient's Sex	0010,0040	0010,0040	-	0010,0040	0010,0040
Other Patient IDs	0010,1000	-	-	0010,1000	0010,1000
Patient Weight	0010,1030	-	-	0010,1030	0010,1030
Medical Alerts	0010,2000	-	-	0010,2000	-
Contrast Allergies	0010,2110	-	-	0010,2110	-
Ethnic group	0010,2160	-	-	0010,2160	0010,2160
Additional Patient History	0010,21B0	-	-	0010,21B0	0010,21B0
Pregnancy Status	0010,21C0	-	-	0010,21C0	-
Patient Comments	0010,4000	-	-	0010,4000	0010,4000
Protocol Name	-	-	0018,1030	0018,1030	0018,1030
Study Instance UID	0020,000D	0020,000D	-	0020,000D	0020,000D
Series Instance UID	-	-	0020,000E	0020,000E	0020,000E
Series description	-	-	0008,103E	0008,103E	0008,103E
Study ID	-	0020,0010	-	0020,0010	0020,0010
Requesting Physician	0032,1032	-	-	0032,1032	-
Requested Procedure Description	0032,1060	0032,1060	-	0032,1060	-
				0008,1030[1]	0008,1030[1]
Requested Procedure Code Sequence	0032,1064	-	-	0008,1030[1]	0008,1030[1]
Admission ID	0038,0010	-	-	0038,0010	-
Special Needs	0038,0050	-	-	0038,0050	-
Patient State	0038,0500	-	-	0038,0500	0038,0500
Scheduled Procedure Step Description	0040,0007	0040,0007	-	0040,0007	0040,0007
				0008,1030[1]	0008,1030[1]
				0040,0254	0040,0254
Scheduled Protocol Code Sequence	0040,0008	-	-	0040,0008	0040,0008
				0040,0260	0040,0260
Scheduled Procedure Step ID	0040,0009	0040,0009	-	0040,0009	0040,0009
Performed Procedure Step Start Date	-	0040,0244	-	-	0040,0244
Performed Procedure Step Start Time	-	0040,0245	-	-	0040,0245
Performed Procedure Step ID	-	0040,0253	-	0040,0253	0040,0253
Requested Procedure ID	0040,1001	0040,1001	-	0040,1001	0040,1001
Requested Procedure Comments	0040,1400	-	-	0008,1030[1]	0008,1030[1]
Confidentiality Constraint on Patient Data Description	0040,3001	-	-	0040,3001	-

Note [1]: Mapping is user configurable.

11.1.4. Coerced/Modified fields

Not applicable.

11.2. Data Dictionary of Private Attributes

The Export software provides Standard Extended conformances to the DICOM PET SOP Class. The additional Private data elements that may be included have group number 0x7053. These elements may contain GEMINI specific information that could not be encoded in the standard PET IOD, and would be meaningless for non-GEMINI systems. However, some receiving systems may need to be informed of the VR for these private elements in order to properly receive and store them. The following table shows the VR for each of these elements.

Table 253: Private Elements for PET Images

Tag	VR	Description	VM
(7053,0010)	LO	Private Creator Data Element	1
(7053,1000)	DS	SUV Scale Factor[1]	1
(7053,1001)	OB	Private	1
(7053,1002)	OB	Private	1
(7053,1003)	ST	Original image file name	1
(7053,1009)	DS	Activity Concentration Scale Factor[2]	1
(7053,1013)	SS	Private	1
(7053,1014)	SS	Private	1
(7053,1015)	SS	Private	1
(7053,1016)	SS	Private	1
(7053,1017)	SS	Private	1
(7053,1018)	SS	Private	1
(7053,10C2)	UI	PET-CT Multi Modality Name	1
(7053,1005)	LO	Filename	1
(7053,1006)	OB	Private	1
(00E1,0010)	LO	Private Creator Data Element	1
(00E1,10C2)	UI	PET-CT Multi Modality Name	1
(01E1,0010)	LO	Private Creator Data Element	1
(01E1,1021)	UI	CT Gating UID	1
(01F1,0010)	LO	Private Creator Data Element	1

The Private Creator Data Element (7053,0010), which is used to reserve these private data elements, has value "Philips PET Private Group". For Private Creator Data Element (00E1, 0010), (01E1,0010) and (01F1, 0010) the value is ELSCINT1.

Notes:

1. This value only applies when Units (0054,1001) is equal to CNTS. The SUV Scale Factor is used to convert the pixel data from counts to an SUV value. This is done by using the formula **SUV Value = ((SV * m) + b) * f**, where:
- SV = original stored pixel value
- m = Rescale Slope (0028,1053)
- b = Rescale Intercept (0028,1052)
- f = SUV Scale Factor (7053, 1000)

If the SUV Scale Factor is 0.0, then the pixel data cannot be converted from counts to an SUV value.

2. This value only applies when Units (0054,1001) is equal to CNTS. The Activity Concentration Scale Factor is used to convert the pixel data from counts to Activity Concentration (in Bq/ml). This is done by using the formula **Activity Concentration Value = ((SV * m) + b) * f**, where:

- SV = original stored pixel value
- m = Rescale Slope (0028,1053)
- b = Rescale Intercept (0028,1052)
- f = Activity Concentration Scale Factor (7053, 1009)

If the Activity Concentration Scale Factor is 0.0, then the pixel data cannot be converted from counts to Activity Concentration.

Table 254: Private Elements for Secondary Capture Images

Tag	VR	Description	VM
(7053,0010)	LO	Private Creator Data element	1
(7053,1003)	ST	Original image file name	1

Table 255: Private Elements for PET Raw Data

Tag	VR	Description	VM
(7053,0010)	LO	Private Creator Data Element	1
(7053,1007)	SQ	Acquisition File Sequence	1
> (7053,1003)	LO	File Name	1
> (7053,100F)	UL	Segment Size	1
> (7053,1010)	US	Segment Number	1
> (7053,1011)	US	Number of Segments	1
> (7053,1012)	SQ	File Data Sequence	1
>> (7053,1004)	OB	File Data	1
(7053,1005)	LO	Filename	1
(7053,1006)	OB	Private	1

11.3. Coded Terminology and Templates

This application supports the following Coded Terminology and templates as described in the sub-sections.

11.3.1. Context Groups

Table 256: Context groups

Context group names	Content ID
Patient Orientation	CID 19
Patient Orientation Modifier	CID 20
Patient Gantry Relationship	CID 21
PET Radionuclide	CID 4020
PET Radiopharmaceuticals	CID 4021
Route of Administration	CID 11
Nuclear Medicine Projections	CID 26
NM Procedural State Values	CID 3101
NM Radionuclide	CID 18
PET Anatomic Regions	CID 4031
Related Series Purposes of Reference	CID 7210
Referenced Image Purpose of Reference	CID 7201

11.3.2. Template Specifications

Table 257: GEMINI TF templates

Template Name	Template ID
NM Acquisition Context	TID 3470

11.3.3. Private code definitions

The following table lists private code values that may appear in Philips PET and NM images. The Coding Scheme Designator is always “99PHG”.

Table 258: PET Coded Terminology

Code Value	Code Meaning
P-Cs137	Cesium 137
P-Unknown	Unknown

11.4. Grayscale Image consistency

Not applicable.

11.5. Standard Extended/Specialized/Private SOPs

No Specialized or Private SOP Classes are supported. PET images produced by the scanner conform to the PET IOD as a Standard Extended SOP Class, as described in section 11.2.

11.6. Private Transfer Syntaxes

Not applicable.

12. ANNEXES OF APPLICATION "FUSION VIEWER" AND "AUTO REGISTRATION"

12.1. IOD Contents

12.1.1. Created SOP Instance

This section specifies each IOD created (including private IODs). It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Abbreviations used in the IOD tables for the column "Presence of Module" are:

ALWAYS	The module is always present
CONDITIONAL	The module is used under specified condition

Abbreviations used in the Module table for the column "Presence of Value" are:

ALWAYS	The attribute is always present with a value
EMPTY	The attribute is always present without any value (attribute sent zero length)
VNAP	The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
ANAP	The attribute is present under specified condition – if present then it will always have a value
ANAPCV	The attribute is present under specified condition – if present then its Value is Not Always Present (attribute sent zero length if condition applies and no value is present)
ANAPEV	The attribute is present under specified condition – if present then it will not have any value

The abbreviations used in the Module table for the column "Source" are:

AUTO	The attribute value is generated automatically
CONFIG	The attribute value source is a configurable parameter
COPY	The attribute value source is another SOP instance
FIXED	The attribute value is hard-coded in the application
IMPLICIT	The attribute value source is a user-implicit setting
MPPS	The attribute value is the same as that use for Modality Performed Procedure Step
MWL	The attribute value source is a Modality Worklist
USER	The attribute value source is explicit user input

Items in the Value and Comment columns in the following tables are filled in where appropriate to further clarify the use or meaning of each attribute beyond the definition provided by the DICOM Standard. All others are left blank for ease of use. See PS3.3 of the DICOM Standard for the complete attribute definitions.

Table 259: Extended Attributes of CT Image Storage

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Medical Alerts	0010,2000	LO		ANAP	COPY	
Allergies	0010,2110	LO		ANAP	COPY	
Pregnancy Status	0010,21C0	US		ANAP	COPY	
Special Needs	0038,0050	LO		ANAP	COPY	
Requesting Physician	0032,1032	PN		ANAP	COPY	
Requesting Service	0032,1033	LO		ANAP	COPY	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Requested Procedure Description	0032,1060	LO		ANAP	COPY	
Admission ID	0038,0010	LO		ANAP	COPY	
Confidentiality Constraint on Patient Data Description	0040,3001	LO		ANAP	COPY	

Table 260: Extended Attributes of MR Image Storage

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Address	0010,1040	LO		ANAP	COPY	
Rescale Intercept	0028,1052	DS		ANAP	COPY	
Rescale Slope	0028,1053	DS		ANAP	COPY	
Rescale Type	0028,1054	LO		ANAP	COPY	
Number of Slices	0054,0081	US		ANAP	COPY	
Image Index	0054,1330	US		ANAP	COPY	

Table 261: Extended Attributes of Molti-frame True Color Secondary Capture Image Storage

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Medical Alerts	0010,2000	LO		ANAP	AUTO	
Allergies	0010,2110	LO		ANAP	AUTO	
Pregnancy Status	0010,21C0	US		ANAP	AUTO	
Requesting Physician	0032,1032	PN		ANAP	AUTO	
Requesting Service	0032,1033	LO		ANAP	AUTO	
Requested Procedure Description	0032,1060	LO		ANAP	AUTO	
Special Needs	0038,0050	LO		ANAP	AUTO	
Patient State	0038,0500	LO		ANAP	AUTO	

Table 262: Extended Attributes of Nuclear Medicine Image Storage

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Medical Alerts	0010,2000	LO		ANAP	COPY	
Allergies	0010,2110	LO		ANAP	COPY	
Pregnancy Status	0010,21C0	US		ANAP	COPY	
Rescale Slope	0028,1053	DS		ANAP	COPY	
Requesting Physician	0032,1032	PN		ANAP	COPY	
Requesting Service	0032,1033	LO		ANAP	COPY	
Requested Procedure Description	0032,1060	LO		ANAP	COPY	
Special Needs	0038,0050	LO		ANAP	COPY	

Table 263: Extended Attributes of PET Image Storage

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast/Bolus Route	0018,1040	LO		ANAP	COPY	
Table Height	0018,1130	DS		ANAP	COPY	
DateTime	0040,A120	DT		ANAP	COPY	

Table 264: Extended Attributes of RT Structure Set Storage

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Medical Alerts	0010,2000	LO		ANAP	COPY	
Allergies	0010,2110	LO		ANAP	COPY	
Pregnancy Status	0010,21C0	US		ANAP	COPY	
Requesting Physician	0032,1032	PN		ANAP	COPY	
Requesting Service	0032,1033	LO		ANAP	COPY	
Requested Procedure Description	0032,1060	LO		ANAP	COPY	
Special Needs	0038,0050	LO		ANAP	COPY	
Patient State	0038,0500	LO		ANAP	COPY	

12.1.1.1. List of created SOP Classes

Table 265: List of created SOP Classes

SOP Class Name	SOP Class UID
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
Nuclear Medicine Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.20
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128
RT Structure Set Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.3
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1

12.1.1.2. CT Image Storage SOP Class

Table 266: IOD of Created CT Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Plane Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	CT Image Module	ALWAYS
Image	VOI LUT Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 267: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Ethnic Group	0010,2160	SH		ANAP	COPY	
Patient Comments	0010,4000	LT		ANAP	COPY	
Patient ID	0010,0020	LO		ANAP	COPY	
Patient's Birth Date	0010,0030	DA		ANAP	COPY	
Patient's Name	0010,0010	PN		ANAP	COPY	
Patient's Sex	0010,0040	CS		ANAP	COPY	

Table 268: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		ANAP	COPY	
Name of Physician(s) Reading Study	0008,1060	PN		ANAP	COPY	
Referring Physician's Name	0008,0090	PN		ANAP	COPY	
Study Date	0008,0020	DA		ANAP	COPY	
Study Description	0008,1030	LO		ANAP	COPY	
Study ID	0020,0010	SH		ANAP	COPY	
Study Instance UID	0020,000D	UI		ANAP	COPY	
Study Time	0008,0030	TM		ANAP	COPY	
Referenced Study Sequence	0008,1110	SQ		ANAP	COPY	
>Referenced SOP Class UID	0008,1150	UI		ANAP	COPY	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	COPY	

Table 269: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Body Part Examined	0018,0015	CS		ANAP	COPY	
Laterality	0020,0060	CS		ANAP	COPY	
Modality	0008,0060	CS		ANAP	COPY	
Operators' Name	0008,1070	PN		ANAP	COPY	
Patient Position	0018,5100	CS		ANAP	COPY	
Protocol Name	0018,1030	LO		ANAP	COPY	
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Description	0008,103E	LO		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	COPY	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Referenced SOP Class UID	0008,1150	UI		ANAP	COPY	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	COPY	
Request Attributes Sequence	0040,0275	SQ		ANAP	COPY	
>Requested Procedure ID	0040,1001	SH		ANAP	COPY	
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	COPY	
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	COPY	
>Scheduled Protocol Code Sequence	0040,0008	SQ		ANAP	COPY	
>>Code Meaning	0008,0104	LO		ANAP	COPY	
>>Code Value	0008,0100	SH		ANAP	COPY	
>>Coding Scheme Designator	0008,0102	SH		ANAP	COPY	
Performed Procedure Step ID	0040,0253	SH		ANAP	COPY	

Table 270: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ALWAYS	COPY	
Acquisition Time	0008,0032	TM		ALWAYS	COPY	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Image Comments	0020,4000	LT		VNAP	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

Table 271: Image Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Orientation (Patient)	0020,0037	DS		ALWAYS	AUTO	
Image Position (Patient)	0020,0032	DS		ALWAYS	AUTO	
Pixel Spacing	0028,0030	DS		ALWAYS	AUTO	
Slice Thickness	0018,0050	DS		ALWAYS	AUTO	

Table 272: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Columns	0028,0011	US		ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW OB		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	

Table 273: CT Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Number	0020,0012	IS		VNAP	COPY	
Bits Allocated	0028,0100	US		ALWAYS	COPY	
Bits Stored	0028,0101	US		ALWAYS	COPY	
Convolution Kernel	0018,1210	SH		ANAPCV	COPY	
Data Collection Diameter	0018,0090	DS		ANAPCV	COPY	
Exposure	0018,1152	IS		ANAPCV	COPY	
Filter Type	0018,1160	SH		ANAPCV	COPY	
Gantry/Detector Tilt	0018,1120	DS		ANAPCV	COPY	
High Bit	0028,0102	US		ALWAYS	COPY	
Image Type	0008,0008	CS		ALWAYS	COPY	
KVP	0018,0060	DS		VNAP	COPY	
Photometric Interpretation	0028,0004	CS		ALWAYS	COPY	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Reconstruction Diameter	0018,1100	DS		ANAPCV	COPY	
Rescale Intercept	0028,1052	DS		ALWAYS	COPY	
Rescale Slope	0028,1053	DS		ALWAYS	COPY	
Rotation Direction	0018,1140	CS		ANAPCV	COPY	
Samples per Pixel	0028,0002	US		ALWAYS	COPY	
Scan Options	0018,0022	CS		ANAPCV	COPY	
Table Height	0018,1130	DS		ANAPCV	COPY	
X-ray Tube Current	0018,1151	IS		ANAPCV	COPY	

Table 274: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ALWAYS	AUTO	
Window Width	0028,1051	DS		ALWAYS	AUTO	

Table 275: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	

12.1.1.3. MR Image Storage SOP Class

Table 276: IOD of Created MR Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Plane Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	MR Image Module	ALWAYS
Image	VOI LUT Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 277: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient Comments	0010,4000	LT		ANAP	COPY	
Patient ID	0010,0020	LO		ANAP	COPY	
Patient's Birth Date	0010,0030	DA		ANAP	COPY	
Patient's Name	0010,0010	PN		ANAP	COPY	
Patient's Sex	0010,0040	CS		ANAP	COPY	

Table 278: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		ANAP	COPY	
Name of Physician(s) Reading Study	0008,1060	PN		ANAP	COPY	
Referring Physician's Name	0008,0090	PN		ANAP	COPY	
Study Date	0008,0020	DA		ANAP	COPY	
Study Description	0008,1030	LO		ANAP	COPY	
Study ID	0020,0010	SH		ALWAYS	COPY	
Study Instance UID	0020,000D	UI		ALWAYS	COPY	
Study Time	0008,0030	TM		ANAP	COPY	

Table 279: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Body Part Examined	0018,0015	CS		ANAP	COPY	
Laterality	0020,0060	CS		ANAP	COPY	
Modality	0008,0060	CS		ANAP	COPY	
Operators' Name	0008,1070	PN		ANAP	COPY	
Patient Position	0018,5100	CS		ANAP	COPY	
Performing Physician's Name	0008,1050	PN		ANAP	COPY	
Protocol Name	0018,1030	LO		ANAP	COPY	
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Description	0008,103E	LO		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Performed Procedure Step Description	0040,0254	LO		ANAP	COPY	
Performed Procedure Step ID	0040,0253	SH		ANAP	COPY	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	COPY	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	COPY	

Table 280: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ALWAYS	COPY	
Acquisition Number	0020,0012	IS		ANAP	COPY	
Acquisition Time	0008,0032	TM		ALWAYS	COPY	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Image Comments	0020,4000	LT		VNAP	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Referenced Image Sequence	0008,1140	SQ		ANAP	COPY	
>Referenced SOP Class UID	0008,1150	UI		VNAP	COPY	
>Referenced SOP Instance UID	0008,1155	UI		VNAP	COPY	

Table 281: Image Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Orientation (Patient)	0020,0037	DS		ALWAYS	AUTO	
Image Position (Patient)	0020,0032	DS		ALWAYS	AUTO	
Pixel Spacing	0028,0030	DS		ALWAYS	AUTO	
Slice Thickness	0018,0050	DS		ALWAYS	AUTO	

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Table 282: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Stored	0028,0101	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Largest Image Pixel Value	0028,0107	US SS		ANAP	COPY	
Pixel Data	7FE0,0010	OW OB		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Smallest Image Pixel Value	0028,0106	US SS		ANAP	COPY	

Table 283: MR Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Allocated	0028,0100	US		ALWAYS	COPY	
Echo Time	0018,0081	DS		VNAP	COPY	
Echo Train Length	0018,0091	IS		VNAP	COPY	
Image Type	0008,0008	CS		ALWAYS	AUTO	
MR Acquisition Type	0018,0023	CS		VNAP	COPY	
Photometric Interpretation	0028,0004	CS		ALWAYS	COPY	
Repetition Time	0018,0080	DS		ANAP	COPY	
Samples per Pixel	0028,0002	US		ALWAYS	COPY	
Scan Options	0018,0022	CS		VNAP	COPY	
Scanning Sequence	0018,0020	CS		VNAP	COPY	
Sequence Variant	0018,0021	CS		VNAP	COPY	

Table 284: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ALWAYS	AUTO	
Window Center & Width Explanation	0028,1055	LO		ANAP	AUTO	
Window Width	0028,1051	DS		ALWAYS	AUTO	
VOI LUT Sequence	0028,3010	SQ		ANAP	AUTO	
>LUT Data	0028,3006	US OW		ALWAYS	AUTO	
>LUT Descriptor	0028,3002	US SS		ALWAYS	AUTO	

Table 285: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	

12.1.1.4. Multi-frame True Color Secondary Capture Image Storage

Table 286: IOD of Created Multi-frame True Color Secondary Capture Image Storage Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	Cine Module	ALWAYS
Image	SC Image Module	ALWAYS
Image	SC Multi-frame Image Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 287: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Ethnic Group	0010,2160	SH		ANAP	COPY	
Patient Comments	0010,4000	LT		ANAP	COPY	
Patient ID	0010,0020	LO		ALWAYS	COPY	
Patient's Birth Date	0010,0030	DA		ALWAYS	COPY	
Patient's Name	0010,0010	PN		ALWAYS	COPY	
Patient's Sex	0010,0040	CS		ALWAYS	COPY	

Table 288: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		ANAP	COPY	
Name of Physician(s) Reading Study	0008,1060	PN		ANAP	COPY	
Referring Physician's Name	0008,0090	PN		ANAP	COPY	
Study Date	0008,0020	DA		ANAP	COPY	
Study Description	0008,1030	LO		ANAP	COPY	
Study ID	0020,0010	SH		ALWAYS	COPY	
Study Instance UID	0020,000D	UI		ALWAYS	COPY	
Study Time	0008,0030	TM		ANAP	COPY	
Referenced Study Sequence	0008,1110	SQ		ANAP	COPY	
>Referenced SOP Class UID	0008,1150	UI		VNAP	MWL	
>Referenced SOP Instance UID	0008,1155	UI		VNAP	MWL	

Table 289: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Description	0008,103E	LO		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	COPY	
>Referenced SOP Class UID	0008,1150	UI		ANAP	COPY	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	COPY	
Request Attributes Sequence	0040,0275	SQ		VNAP	COPY	
>Requested Procedure ID	0040,1001	SH		ANAP	COPY	
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	COPY	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	COPY	
>Scheduled Protocol Code Sequence	0040,0008	SQ		ANAP	COPY	
>>Code Meaning	0008,0104	LO		VNAP	MWL	
>>Code Value	0008,0100	SH		VNAP	MWL	
>>Coding Scheme Designator	0008,0102	SH		VNAP	MWL	

Table 290: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Comments	0020,4000	LT		ANAP	AUTO	
Image Type	0008,0008	CS		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Lossy Image Compression	0028,2110	CS		ANAP	AUTO	
Patient Orientation	0020,0020	CS		ANAP	AUTO	

Table 291: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW OB		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Planar Configuration	0028,0006	US		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	

Table 292: Cine Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Cine Rate	0018,0040	IS		ANAP	AUTO	
Frame Time	0018,1063	DS		ANAP	AUTO	
Preferred Playback Sequencing	0018,1244	US		ANAP	AUTO	
Recommended Display Frame Rate	0008,2144	IS		ANAP	AUTO	

Table 293: SC Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date of Secondary Capture	0018,1012	DA		ALWAYS	AUTO	
Time of Secondary Capture	0018,1014	TM		ALWAYS	AUTO	

Table 294: SC Multi-frame Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Burned In Annotation	0028,0301	CS		ANAP	AUTO	
Frame Increment Pointer	0028,0009	AT		ANAP	AUTO	
Presentation LUT Shape	2050,0020	CS		ANAP	AUTO	
Rescale Intercept	0028,1052	DS		ANAP	AUTO	
Rescale Slope	0028,1053	DS		ANAP	AUTO	
Rescale Type	0028,1054	LO		ANAP	AUTO	

Table 295: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	

12.1.1.5. Nuclear Medicine Image Storage SOP Class

Table 296: IOD of Created Nuclear Medicine Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Series	NM/PET Patient Orientation Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	Multi-Frame Module	ALWAYS
Image	NM Image Pixel Module	ALWAYS
Image	NM Multi-frame Module	ALWAYS
Image	NM Image Module	ALWAYS
Image	NM Isotope Module	ALWAYS
Image	NM Detector Module	ALWAYS
Image	NM Tomo Acquisition Module	ALWAYS
Image	NM Multi-gated Acquisition Module	CONDITIONAL
Image	NM Reconstruction Module	ALWAYS
Image	VOI LUT Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 297: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Ethnic Group	0010,2160	SH		ANAP	COPY	
Patient Comments	0010,4000	LT		ANAP	COPY	
Patient ID	0010,0020	LO		ALWAYS	COPY	
Patient's Birth Date	0010,0030	DA		ALWAYS	COPY	
Patient's Name	0010,0010	PN		ALWAYS	COPY	
Patient's Sex	0010,0040	CS		ALWAYS	COPY	

Table 298: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		ANAP	COPY	
Name of Physician(s) Reading Study	0008,1060	PN		ANAP	COPY	
Referring Physician's Name	0008,0090	PN		ANAP	COPY	
Study Date	0008,0020	DA		ANAP	COPY	
Study Description	0008,1030	LO		ANAP	COPY	
Study ID	0020,0010	SH		ALWAYS	COPY	
Study Instance UID	0020,000D	UI		ALWAYS	COPY	
Study Time	0008,0030	TM		ALWAYS	COPY	
Referenced Study Sequence	0008,1110	SQ		ANAP	COPY	
>Referenced SOP Class UID	0008,1150	UI		VNAP	COPY	
>Referenced SOP Instance UID	0008,1155	UI		VNAP	COPY	

Table 299: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Body Part Examined	0018,0015	CS		ANAP	COPY	
Modality	0008,0060	CS		ANAP	COPY	
Protocol Name	0018,1030	LO		ANAP	COPY	
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Description	0008,103E	LO		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	COPY	
>Referenced SOP Class UID	0008,1150	UI		ANAP	COPY	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	COPY	
Performed Procedure Step ID	0040,0253	SH		ANAP	COPY	

Table 300: NM/PET Patient Orientation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient Gantry Relationship Code Sequence	0054,0414	SQ		ANAP	COPY	
>Code Meaning	0008,0104	LO		ANAP	COPY	
>Code Value	0008,0100	SH		ANAP	COPY	
>Coding Scheme Designator	0008,0102	SH		ANAP	COPY	
Patient Orientation Code Sequence	0054,0410	SQ		ANAP	COPY	
>Patient Orientation Modifier Code Sequence	0054,0412	SQ		ANAP	COPY	
>>Code Meaning	0008,0104	LO		ANAP	COPY	
>>Code Value	0008,0100	SH		ANAP	COPY	
>>Coding Scheme Designator	0008,0102	SH		ANAP	COPY	
>Code Meaning	0008,0104	LO		ANAP	COPY	
>Code Value	0008,0100	SH		ANAP	COPY	
>Coding Scheme Designator	0008,0102	SH		ANAP	COPY	

Table 301: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ALWAYS	AUTO	
Acquisition Time	0008,0032	TM		ALWAYS	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Image Comments	0020,4000	LT		VNAP	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

Table 302: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Columns	0028,0011	US		ALWAYS	AUTO	
Largest Image Pixel Value	0028,0107	US SS		ANAP	AUTO	
Pixel Data	7FE0,0010	OW OB		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Smallest Image Pixel Value	0028,0106	US SS		ANAP	AUTO	

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Table 303: Multi-Frame Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	IS		ALWAYS	AUTO	

Table 304: NM Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Allocated	0028,0100	US		ANAP	COPY	
Bits Stored	0028,0101	US		ANAP	COPY	
High Bit	0028,0102	US		ANAP	COPY	
Photometric Interpretation	0028,0004	CS		ANAP	COPY	
Pixel Spacing	0028,0030	DS		ANAP	COPY	
Samples per Pixel	0028,0002	US		ANAP	COPY	

Table 305: NM Multi-frame Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Detector Vector	0054,0020	US		ANAP	COPY	
Energy Window Vector	0054,0010	US		ANAP	COPY	
Frame Increment Pointer	0028,0009	AT		ANAP	COPY	
Number of Detectors	0054,0021	US		ANAP	COPY	
Number of Energy Windows	0054,0011	US		ANAP	COPY	
Number of R-R Intervals	0054,0061	US		ANAP	COPY	
Number of Rotations	0054,0051	US		ANAP	COPY	
Number of Slices	0054,0081	US		VNAP	COPY	
Number of Time Slots	0054,0071	US		VNAP	AUTO	
R-R Interval Vector	0054,0060	US		ANAP	COPY	
Rotation Vector	0054,0050	US		ANAP	AUTO	
Slice Vector	0054,0080	US		ALWAYS	AUTO	
Time Slot Vector	0054,0070	US		VNAP	AUTO	

Table 306: NM Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Termination Condition	0018,0071	CS		ANAP	COPY	
Corrected Image	0028,0051	CS		ANAP	COPY	
Counts Accumulated	0018,0070	IS		ANAP	COPY	
Image ID	0054,0400	SH		ANAP	COPY	
Image Type	0008,0008	CS		ALWAYS	AUTO	
Lossy Image Compression	0028,2110	CS		ANAP	COPY	

Table 307: NM Isotope Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Energy Window Information Sequence	0054,0012	SQ		ANAP	COPY	
>Energy Window Name	0054,0018	SH		ANAP	COPY	
>Energy Window Range Sequence	0054,0013	SQ		ANAP	COPY	
>>Energy Window Lower Limit	0054,0014	DS		ANAP	COPY	
>>Energy Window Upper Limit	0054,0015	DS		ANAP	COPY	
Radiopharmaceutical Information Sequence	0054,0016	SQ		ANAP	COPY	
>Radionuclide Total Dose	0018,1074	DS		ANAP	COPY	
>Radiopharmaceutical	0018,0031	LO		ANAP	COPY	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Radiopharmaceutical Start Time	0018,1072	TM		ANAP	COPY	
>Radiopharmaceutical Volume	0018,1071	DS		ANAP	COPY	
>Radionuclide Code Sequence	0054,0300	SQ		ANAP	COPY	
>>Code Meaning	0008,0104	LO		ANAP	COPY	
>>Code Value	0008,0100	SH		ANAP	COPY	
>>Coding Scheme Designator	0008,0102	SH		ANAP	COPY	

Table 308: NM Detector Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Detector Information Sequence	0054,0022	SQ		ANAP	COPY	
>Collimator Type	0018,1181	CS	NONE	ANAP	COPY	
>Collimator/grid Name	0018,1180	SH		ANAP	COPY	
>Focal Distance	0018,1182	IS		ANAP	COPY	
>Image Orientation (Patient)	0020,0037	DS		ANAP	COPY	
>Image Position (Patient)	0020,0032	DS		ANAP	COPY	
>View Code Sequence	0054,0220	SQ		ANAP	COPY	
>>Code Meaning	0008,0104	LO		ANAP	COPY	
>>Code Value	0008,0100	SH		ANAP	COPY	
>>Coding Scheme Designator	0008,0102	SH		ANAP	COPY	

Table 309: NM Tomo Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rotation Information Sequence	0054,0052	SQ		ANAP	COPY	
>Actual Frame Duration	0018,1242	IS		ANAP	COPY	
>Angular Step	0018,1144	DS		ANAP	COPY	
>Number of Frames in Rotation	0054,0053	US		ANAP	COPY	
>Rotation Direction	0018,1140	CS		ANAP	COPY	
>Scan Arc	0018,1143	DS		ANAP	COPY	
>Start Angle	0054,0200	DS		ANAP	COPY	
>Table Height	0018,1130	DS		ANAP	COPY	
>Table Traverse	0018,1131	DS		ANAP	COPY	

Table 310: NM Multi-gated Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Gated Information Sequence	0054,0062	SQ		ANAP	COPY	
>Data Information Sequence	0054,0063	SQ		ANAP	COPY	
>>Frame Time	0018,1063	DS		ANAP	COPY	
>>Time Slot Information Sequence	0054,0072	SQ		ANAP	COPY	
>>>Time Slot Time	0054,0073	DS		ANAPCV	COPY	

Table 311: NM Reconstruction Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Slice Thickness	0018,0050	DS		VNAP	AUTO	
Spacing Between Slices	0018,0088	DS		VNAP	AUTO	

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Table 312: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ALWAYS	AUTO	
Window Width	0028,1051	DS		ALWAYS	AUTO	

Table 313: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	

12.1.1.6. Positron Emission Tomography Image Storage SOP Class

Table 314: IOD of Created Positron Emission Tomography Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Series	PET Series Module	ALWAYS
Series	PET Isotope Module	ALWAYS
Series	NM/PET Patient Orientation Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Plane Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	PET Image Module	ALWAYS
Image	VOI LUT Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 315: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient ID	0010,0020	LO		ALWAYS	COPY	
Patient's Birth Date	0010,0030	DA		ANAP	COPY	
Patient's Name	0010,0010	PN		ALWAYS	COPY	
Patient's Sex	0010,0040	CS		ALWAYS	COPY	

Table 316: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		ANAP	COPY	
Name of Physician(s) Reading Study	0008,1060	PN		ANAP	COPY	
Referring Physician's Name	0008,0090	PN		ANAP	COPY	
Study Date	0008,0020	DA		ANAP	COPY	
Study Description	0008,1030	LO		ANAP	COPY	
Study ID	0020,0010	SH		ALWAYS	COPY	
Study Instance UID	0020,000D	UI		ALWAYS	COPY	
Study Time	0008,0030	TM		ANAP	COPY	

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Table 317: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ANAP	COPY	
Operators' Name	0008,1070	PN		ANAP	COPY	
Patient Position	0018,5100	CS		ANAP	COPY	
Series Description	0008,103E	LO		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Performed Procedure Step ID	0040,0253	SH		ANAP	COPY	
Performed Procedure Step Start Date	0040,0244	DA		ANAP	COPY	
Performed Procedure Step Start Time	0040,0245	TM		ANAP	COPY	

Table 318: PET Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Start Condition	0018,0073	CS		ANAP	COPY	
Acquisition Start Condition Data	0018,0074	IS		ANAP	COPY	
Acquisition Termination Condition	0018,0071	CS		ANAP	COPY	
Acquisition Termination Condition Data	0018,0075	IS		ANAP	COPY	
Attenuation Correction Method	0054,1101	LO		ANAP	COPY	
Axial Mash	0054,1201	IS		ANAP	COPY	
Coincidence Window Width	0054,1210	DS		ANAP	COPY	
Collimator Type	0018,1181	CS	NONE	ANAP	COPY	
Corrected Image	0028,0051	CS		ANAP	COPY	
Counts Source	0054,1002	CS		ANAP	COPY	
Decay Correction	0054,1102	CS		ANAP	COPY	
Field of View Dimension(s)	0018,1149	IS		ANAP	COPY	
Field of View Shape	0018,1147	CS	CYLINDRICAL RING	ANAP	COPY	
Gantry/Detector Tilt	0018,1120	DS		ANAP	COPY	
Number of Slices	0054,0081	US		ALWAYS	AUTO	
Number of Time Slices	0054,0101	US		ANAP	COPY	
Randoms Correction Method	0054,1100	CS		ANAP	COPY	
Reconstruction Method	0054,1103	LO		ANAP	COPY	
Scatter Correction Method	0054,1105	LO		ANAP	COPY	
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Series Type	0054,1000	CS		ANAP	COPY	
Transverse Mash	0054,1202	IS		ANAP	COPY	
Type of Detector Motion	0054,0202	CS	NONE	ANAP	COPY	
Units	0054,1001	CS	SUV, BQML, CNTS	ALWAYS	IMPLICIT	
Energy Window Range Sequence	0054,0013	SQ		ANAP	COPY	
>Energy Window Lower Limit	0054,0014	DS		ANAP	COPY	
>Energy Window Upper Limit	0054,0015	DS		ANAP	COPY	

Table 319: PET Isotope Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Radiopharmaceutical Information Sequence	0054,0016	SQ		ANAP	COPY	
>Radionuclide Half Life	0018,1075	DS		ANAP	COPY	
>Radionuclide Positron Fraction	0018,1076	DS		ANAP	COPY	
>Radionuclide Total Dose	0018,1074	DS		ANAP	COPY	
>Radiopharmaceutical	0018,0031	LO		ANAP	COPY	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>Radiopharmaceutical Start Time	0018,1072	TM		ANAP	COPY	
>Radiopharmaceutical Volume	0018,1071	DS		ANAP	COPY	
>Radionuclide Code Sequence	0054,0300	SQ		ANAP	COPY	
>>Code Meaning	0008,0104	LO		ANAP	COPY	
>>Code Value	0008,0100	SH		ANAP	COPY	
>>Coding Scheme Designator	0008,0102	SH		ANAP	COPY	
>Radiopharmaceutical Code Sequence	0054,0304	SQ		ANAP	COPY	
>>Code Meaning	0008,0104	LO		ANAP	COPY	
>>Code Value	0008,0100	SH		ANAP	COPY	
>>Coding Scheme Designator	0008,0102	SH		ANAP	COPY	

Table 320: NM/PET Patient Orientation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient Gantry Relationship Code Sequence	0054,0414	SQ		ANAP	COPY	
>Code Meaning	0008,0104	LO		ANAP	COPY	
>Code Value	0008,0100	SH		ANAP	COPY	
>Coding Scheme Designator	0008,0102	SH		ANAP	COPY	
Patient Orientation Code Sequence	0054,0410	SQ		ANAP	COPY	
>Patient Orientation Modifier Code Sequence	0054,0412	SQ		ANAP	COPY	
>>Code Meaning	0008,0104	LO		ANAP	COPY	
>>Code Value	0008,0100	SH		ANAP	COPY	
>>Coding Scheme Designator	0008,0102	SH		ANAP	COPY	
>Code Meaning	0008,0104	LO		ANAP	COPY	
>Code Value	0008,0100	SH		ANAP	COPY	
>Coding Scheme Designator	0008,0102	SH		ANAP	COPY	

Table 321: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

Table 322: Image Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Orientation (Patient)	0020,0037	DS		ALWAYS	AUTO	
Image Position (Patient)	0020,0032	DS		ALWAYS	AUTO	
Pixel Spacing	0028,0030	DS		ALWAYS	AUTO	
Slice Thickness	0018,0050	DS		ALWAYS	AUTO	

Table 323: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Columns	0028,0011	US		ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW OB		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	

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Table 324: PET Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Date	0008,0022	DA		ANAP	COPY	
Acquisition Time	0008,0032	TM		ANAP	COPY	
Actual Frame Duration	0018,1242	IS		ANAP	COPY	
Bits Allocated	0028,0100	US		ANAP	COPY	
Bits Stored	0028,0101	US		ANAP	COPY	
Decay Factor	0054,1321	DS		ANAP	COPY	
Dose Calibration Factor	0054,1322	DS		ANAP	COPY	
Frame Reference Time	0054,1300	DS		ANAP	COPY	
High Bit	0028,0102	US		ANAP	COPY	
Image Index	0054,1330	US		ANAP	COPY	
Image Type	0008,0008	CS		ANAP	COPY	
Intervals Acquired	0018,1083	IS		ANAP	COPY	
Intervals Rejected	0018,1084	IS		ANAP	COPY	
Lossy Image Compression	0028,2110	CS		ANAP	COPY	
Photometric Interpretation	0028,0004	CS		ANAP	COPY	
Rescale Intercept	0028,1052	DS		ANAP	COPY	
Rescale Slope	0028,1053	DS		ANAP	COPY	
Samples per Pixel	0028,0002	US		ANAP	COPY	
Scatter Fraction Factor	0054,1323	DS		ANAP	COPY	
Slice Sensitivity Factor	0054,1320	DS		ANAP	COPY	

Table 325: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ALWAYS	AUTO	
Window Width	0028,1051	DS		ALWAYS	AUTO	

Table 326: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	
Instance Creator UID	0008,0014	UI		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	

12.1.1.7. RT Structure Set Storage SOP Class

Table 327: IOD of Created RT Structure Set Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	RT Series Module	ALWAYS
Structure Set	Structure Set Module	ALWAYS
Structure Set	ROI Contour Module	ALWAYS
Structure Set	SOP Common Module	ALWAYS

Table 328: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Ethnic Group	0010,2160	SH		ANAP	COPY	
Other Patient IDs	0010,1000	LO		ANAP	COPY	
Patient Comments	0010,4000	LT		ANAP	COPY	
Patient ID	0010,0020	LO		ANAP	COPY	
Patient's Birth Date	0010,0030	DA		ANAP	COPY	
Patient's Name	0010,0010	PN		ANAP	COPY	
Patient's Sex	0010,0040	CS		ANAP	COPY	

Table 329: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		ANAP	COPY	
Referring Physician's Name	0008,0090	PN		ANAP	COPY	
Study Date	0008,0020	DA		ANAP	COPY	
Study Description	0008,1030	LO		ANAP	COPY	
Study ID	0020,0010	SH		ANAP	COPY	
Study Instance UID	0020,000D	UI		ANAP	COPY	
Study Time	0008,0030	TM		ANAP	COPY	
Referenced Study Sequence	0008,1110	SQ		ANAP	COPY	
>Referenced SOP Class UID	0008,1150	UI		ANAP	COPY	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	COPY	

Table 330: RT Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Description	0008,103E	LO		ANAP	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ANAP	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ANAP	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	AUTO	
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO	
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	AUTO	
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO	

Table 331: Structure Set Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Structure Set Date	3006,0008	DA		ALWAYS	AUTO	
Structure Set Label	3006,0002	SH		ALWAYS	AUTO	
Structure Set Name	3006,0004	LO		VNAP	AUTO	
Structure Set Time	3006,0009	TM		ALWAYS	AUTO	
Referenced Frame of Reference Sequence	3006,0010	SQ		ALWAYS	AUTO	
>Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	
>RT Referenced Study Sequence	3006,0012	SQ		ALWAYS	AUTO	
>>RT Referenced Series Sequence	3006,0014	SQ		ALWAYS	AUTO	
>>>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
>>>Contour Image Sequence	3006,0016	SQ		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
>>>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>>>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Structure Set ROI Sequence	3006,0020	SQ		ALWAYS	AUTO	
>Referenced Frame of Reference UID	3006,0024	UI		ALWAYS	AUTO	
>ROI Name	3006,0026	LO		ALWAYS	AUTO	
>ROI Number	3006,0022	IS		ALWAYS	AUTO	

Table 332: ROI Contour Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
ROI Contour Sequence	3006,0039	SQ		ALWAYS	AUTO	
>Referenced ROI Number	3006,0084	IS		ALWAYS	AUTO	
>ROI Display Color	3006,002A	IS		ALWAYS	AUTO	
>Contour Sequence	3006,0040	SQ		ALWAYS	AUTO	
>>Contour Data	3006,0050	DS		ALWAYS	AUTO	
>>Contour Geometric Type	3006,0042	CS	CLOSED_PLANAR	ALWAYS	AUTO	
>>Contour Number	3006,0048	IS		VNAP	AUTO	
>>Contour Slab Thickness	3006,0044	DS		VNAP	AUTO	
>>Number of Contour Points	3006,0046	IS		ALWAYS	AUTO	
>>Contour Image Sequence	3006,0016	SQ		ALWAYS	AUTO	
>>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

Table 333: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

12.1.1.8. Secondary Capture Image Storage SOP Class

Table 334: IOD of Created Secondary Capture Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	SC Image Module	ALWAYS
Image	Modality LUT Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 335: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient ID	0010,0020	LO		ANAP	COPY	
Patient's Birth Date	0010,0030	DA		ANAP	COPY	
Patient's Name	0010,0010	PN		ANAP	COPY	
Patient's Sex	0010,0040	CS		ANAP	COPY	

Table 336: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		ANAP	COPY	
Name of Physician(s) Reading Study	0008,1060	PN		ANAP	COPY	
Referring Physician's Name	0008,0090	PN		ANAP	COPY	
Study Date	0008,0020	DA		ANAP	COPY	
Study Description	0008,1030	LO		ANAP	COPY	
Study ID	0020,0010	SH		ANAP	COPY	
Study Instance UID	0020,000D	UI		ANAP	COPY	
Study Time	0008,0030	TM		ANAP	COPY	
Procedure Code Sequence	0008,1032	SQ		ANAP	COPY	
>Code Meaning	0008,0104	LO		ANAP	COPY	
>Code Value	0008,0100	SH		ANAP	COPY	
>Coding Scheme Designator	0008,0102	SH		ANAP	COPY	

Table 337: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Description	0008,103E	LO		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	

Table 338: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Burned In Annotation	0028,0301	CS		VNAP	AUTO	
Image Comments	0020,4000	LT		VNAP	AUTO	
Image Type	0008,0008	CS		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Lossy Image Compression	0028,2110	CS		VNAP	AUTO	
Patient Orientation	0020,0020	CS		VNAP	AUTO	
Presentation LUT Shape	2050,0020	CS		VNAP	AUTO	

Table 339: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Allocated	0028,0100	US		ALWAYS	AUTO	
Bits Stored	0028,0101	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
High Bit	0028,0102	US		ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW OB		ALWAYS	AUTO	
Pixel Representation	0028,0103	US		ALWAYS	AUTO	

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Planar Configuration	0028,0006	US		ALWAYS	AUTO	
Rows	0028,0010	US		ALWAYS	AUTO	
Samples per Pixel	0028,0002	US		ALWAYS	AUTO	

Table 340: SC Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date of Secondary Capture	0018,1012	DA		ALWAYS	AUTO	
Time of Secondary Capture	0018,1014	TM		ALWAYS	AUTO	

Table 341: Modality LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rescale Intercept	0028,1052	DS		VNAP	AUTO	
Rescale Slope	0028,1053	DS		VNAP	AUTO	
Rescale Type	0028,1054	LO		VNAP	AUTO	

Table 342: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Specific Character Set	0008,0005	CS		ALWAYS	AUTO	

12.1.1.9. Spatial Registration Storage

Table 343: IOD of Created Spatial Registration Storage Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Series	Spatial Registration Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
Spatial Registration	Spatial Registration Module	ALWAYS
Image	Common Instance Reference Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 344: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Ethnic Group	0010,2160	SH		ANAP	AUTO	
Patient Comments	0010,4000	LT		ANAP	AUTO	
Patient ID	0010,0020	LO		ANAP	AUTO	
Patient's Birth Date	0010,0030	DA		ANAP	AUTO	
Patient's Name	0010,0010	PN		ANAP	AUTO	
Patient's Sex	0010,0040	CS		ANAP	AUTO	

Table 345: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		ANAP	COPY	
Name of Physician(s) Reading Study	0008,1060	PN		ANAP	COPY	
Referring Physician's Name	0008,0090	PN		ANAP	COPY	
Study Date	0008,0020	DA		ANAP	COPY	
Study Description	0008,1030	LO		ANAP	COPY	
Study ID	0020,0010	SH		ANAP	COPY	
Study Instance UID	0020,000D	UI		ANAP	COPY	
Study Time	0008,0030	TM		ANAP	COPY	
Referenced Study Sequence	0008,1110	SQ		ANAP	COPY	
>Referenced SOP Class UID	0008,1150	UI		ANAP	COPY	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	COPY	

Table 346: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Description	0008,103E	LO		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	COPY	
>Referenced SOP Class UID	0008,1150	UI		ANAP	COPY	
>Referenced SOP Instance UID	0008,1155	UI		ANAP	COPY	
Request Attributes Sequence	0040,0275	SQ		ANAP	COPY	
>Requested Procedure ID	0040,1001	SH		ANAP	COPY	
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	COPY	
>Scheduled Procedure Step ID	0040,0009	SH		ANAP	COPY	
>Scheduled Protocol Code Sequence	0040,0008	SQ		ANAP	COPY	
>>Code Meaning	0008,0104	LO		ANAP	COPY	
>>Code Value	0008,0100	SH		ANAP	COPY	
>>Coding Scheme Designator	0008,0102	SH		ANAP	COPY	
Performed Procedure Step ID	0040,0253	SH		ANAP	COPY	

Table 347: Spatial Registration Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	AUTO	

Table 348: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	
Position Reference Indicator	0020,1040	LO		VNAP	AUTO	

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Table 349: Spatial Registration Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Registration Sequence	0070,0308	SQ		ALWAYS	AUTO	
>Frame of Reference UID	0020,0052	UI		ANAP	AUTO	
>Matrix Registration Sequence	0070,0309	SQ		ALWAYS	AUTO	
>>Matrix Sequence	0070,030A	SQ		ALWAYS	AUTO	
>>>Frame of Reference Transformation Matrix	3006,00C6	DS		ALWAYS	AUTO	
>>>Frame of Reference Transformation Matrix Type	0070,030C	CS		ALWAYS	AUTO	
>>Registration Type Code Sequence	0070,030D	SQ		ALWAYS	AUTO	
>>>Code Value	0008,0100	SH		ALWAYS	AUTO	
Content Creator's Name	0070,0084	PN		VNAP	AUTO	
Content Description	0070,0081	LO		VNAP	AUTO	
Content Label	0070,0080	CS		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

Table 350: Common Instance Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment

Table 351: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

12.1.2. Usage of Attributes from Received IOD

Not applicable.

12.1.3. Attribute Mapping

Not applicable.

12.1.4. Coerced/Modified fields

Not applicable.

12.2. Data Dictionary of Private Attributes

Not applicable.

12.3. Coded Terminology and Templates

Not applicable.

12.3.1. Context Groups

Not applicable.

12.3.2. Template Specifications

Not applicable.

12.3.3. Private code definitions

Not applicable.

12.4. Grayscale Image consistency

Not applicable.

12.5. Standard Extended/Specialized/Private SOPs

Not applicable.

12.6. Private Transfer Syntaxes

Not applicable.